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# THE AMERICAN PSYCHOLOGIST

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# TOWARD A GENERAL THEORY FOR THE BEHAVIORAL SCIENCES<sup>1</sup>

JAMES G. MILLER

*Mental Health Research Institute, University of Michigan*

ABOUT 1949 a group of scientists at the University of Chicago, some of whom have now moved to the University of Michigan, began to consider whether a sufficient body of facts exists to justify developing an empirically testable general theory of behavior. To refer to the biological and social fields involved, we coined the term "behavioral sciences." We adopted this phrase, first, because its neutral character made it acceptable to both social and biological scientists, and, second, because we foresaw a possibility of someday seeking to obtain financial support from persons who might confound social science with socialism.

In 1946 Senator Fulbright of Arkansas in a Senate debate on establishing the National Science Foundation indicated that such misapprehension exists when he said, "... there may be some misconception with regard to a study of social sciences being confused with what we commonly think of as politics, socialism, or some form of social philosophy. It certainly was not in the minds of the authors of the [Foundation] bill to promote any particular social philosophy of that kind. But a study of certain human relationships and certain scientific bases would have nothing to do with socialism or any subjects of that kind" (4). Comments of certain other Senators during the 79th Congress showed that some of them actually labored under such confusion. And in the vote on including the social sciences explicitly in the Foundation, most of the liberals in both parties voted "aye" while the conservatives voted "nay."

That the misapprehension was not completely dispelled six years later was indicated in the report of the House committee to investigate foundations, of which Representative Cox was chairman: "Many

of our citizens confuse the terms 'social,' as applied to the discipline of the social sciences, with the term 'socialism.' And since the social sciences may be defined as the study of man's relationship to man, the problem of every man considering himself an expert in the field is ever present. . . . But these and other subjects within the orbit of the social sciences are proper subjects for objective study and analysis under conditions of control which give promise of revealing scientific facts" (6).

## THE PLANNING

Long before we had need to solicit financial support, however, our behavioral science group in Chicago began regular planning meetings. We decided to concentrate for a time upon constructing theory, first attempting to agree upon creating a set of interrelated assumptions and theorems capable of being tested by individuals using the empirical techniques of various disciplines. We aimed toward the ultimate goal of a theory embracing all aspects of behavior, but short of that we hoped to structure our research strategy to make possible a salvage of confirmable microtheories about specific areas of behavior.

In the late spring of 1952 a "theory group" began meeting intensively. At first each professor in turn sketched his background and interests, and gave his notions on how to approach the building of a general behavior theory. It soon became clear that we would need to have much patience if we were eventually to develop a common language. It became apparent, also, that certain persons found such group activity unprofitable or uncongenial, either because of well-developed patterns of solitary work, or because of ego involvement with a single point of view and fixed commitment to it, or for other reasons. Such individuals dropped out; new ones were included. Because of the need for the group to maintain its integrity over a relatively long period, we have added members only infre-

<sup>1</sup> Adapted from a paper delivered, among other places, at the Conference on the Evolution of Behavior sponsored by the American Psychological Association and the Society for the Study of Evolution, at Arden House, Harriman, N. Y., on Tuesday, April 5, 1955.

quently. The participant disciplines have been history, anthropology, economics, political science, sociology, social psychology, psychology, psychiatry, medicine, physiology, and mathematical biology. From time to time we have also met with representatives from other areas, such as physics and philosophy. A number of persons have contributed to the work, but the author alone is responsible for distortions present in this effort to give his personal interpretation of the present state of our group thinking. In all probability, each other participant would view our work somewhat differently.

As soon as we had arrived at a degree of primitive agreement, some of us began empirical tests of theorems evolved by the group. Also we searched the literature for elements to add to our theory and for studies to test our theorems.

We have assumed from the start that any adequate theory of behavior would represent in large part a selection from among viewpoints—some even from opposing schools—which have already been stated succinctly and capably. Our quest was *not* for originality with a capital "O."

We chose certain working assumptions, not because we were certain they were more valid than alternatives chosen by other theorists, but in order to get on with the task. First, we agreed to accept as confirmation of theorems only *objective* phenomena available to public inspection by more than one observer, excluding private experience. Second, we tried when possible to state hypotheses *quantitatively*, so that they might be precisely testable and could subsequently be corrected. Third, we attempted to make statements capable of being disproved as well as proved, by *crucial experiments*. Finally, as will be explained below, insofar as possible we employed dimensions of the natural sciences related to the centimeter-gram-second system.

#### GENERAL BEHAVIOR SYSTEMS THEORY

Of the various possible integrations of the relevant data, we have found most profit in what we call *general behavior systems theory*. Systems are bounded regions in space-time, involving energy interchange among their parts, which are associated in functional relationships, and with their environments. General systems theory is a series of related definitions, assumptions, and postulates about all levels of systems from atomic particles through

atoms, molecules, crystals, viruses, cells, organs, individuals, small groups, societies, planets, solar systems, and galaxies. General behavior systems theory is a subcategory of such theory, dealing with living systems, extending roughly from viruses through societies. Perhaps the most significant fact about living things is that they are open systems, with important inputs and outputs. Laws which apply to them differ from those applying to relatively closed systems.

All behavior can be conceived of as energy exchange within an open system or from one such system to another. Any exchange of energy across a boundary results in some alteration or distortion of the energy form. Those specific functions of systems which we can stipulate and whose magnitude we can measure in a relative scale, we will call "variables" if they are within the system and "parameters" if they are in its environment. Each system except the largest of all—the universe—has its environment. The system and its environment together constitute a suprasystem. Each system except the smallest has subsystems, which are any components of an organism that can affect a variable.

Inputs and outputs may be either coded or uncoded. Coding is a linkage within subsystems whereby process  $A_1$  is coupled with process  $A_2$  so that either will elicit the other in the future. Coding involves conditioning, learning, or pairing of two processes in a system and the memory or retention of this union over a period of time. Any action is uncoded unless—like speech or gesture—it has some added significance as a result of such a bond. It then conveys information.

All living systems tend to maintain steady states of many variables, by negative feedback mechanisms which distribute information to subsystems to keep them in orderly balance. Not only are subsystems ordinarily kept in equilibrium, but systems are also usually in balance with their environments, which have outputs into systems and inputs from them. This prevents variations in the environment from destroying systems, either by collapse or by explosion. There is a range of stability for any parameter or variable in any system. It is that range within which the rate of correction is minimal or zero and beyond which correction does occur. Inputs (or loads), either coded or uncoded, which, by lack or excess, force the variables beyond the range of stability constitute stresses and pro-

duce strains within the system. These strains may or may not be capable of being reduced, depending upon the equilibratory resources of the system.

The above general statement can be translated into terminology of several behavioral sciences. In individual psychology, for instance, the system has generally been known as the organism; the input, as the stimulus; and the output, as the response. Uncoded inputs, we have recognized, can result in strains or disequilibria within the organism which are known as primary or somagenic drives. Coded inputs result in secondary, learned, acquired, or psychogenic drives. Reduction of strains is called drive satisfaction. When inputs or loads create strains great enough to call into play complex subsystems to restore equilibrium, we sometimes refer to such processes as "defense mechanisms." When these mechanisms fail, severe disruption of the steady state of the organism, known as mental or physical illness, or ultimately death, occurs. The total of the strains within the individual resulting from his genetic input and variations in the input from his environment is often referred to as his values. The relative urgency of reducing these individual strains determines his hierarchy of values.

#### SPECIFIC ASPECTS OF THE THEORY

##### *System*

Our definition of "system" is very general, and at first sight might appear to apply to almost everything in the world. And, of course, the function of general theory is to be inclusive. However, it may be helpful to indicate what is not a system. The dark-colored half of the Pied Piper was not a system. The opposing lines of two football teams in scrimmage, independent of their backs, would not ordinarily be considered together as a system. If the Headless Horseman of Washington Irving had not been fictional, he could not have held his head in his arm and yet behave like an intact system. All the blondes in the United States are themselves not a system unless they are organized by some sort of communication, like the Red-headed League of A. Conan Doyle. In simple, naive, common-sense terms, then, a real system is all of a thing. Even though it is possible to construct a conceptual system which includes grandpa's mustache, Chinese hokku poetry, and the Brooklyn Bridge, this would not correspond to a real system of general systems theory, because these things are not surrounded by

a single boundary, are not continuous in space-time, and do not have recognizable functional interrelationships.

Some may wonder whether "system" is identical with "Gestalt." Are there laws of the whole which do not apply to specific parts? We hold that both the parts, or subsystems, and the whole behave according to similar laws. However, the fact that subsystems are equilibrated together by system-wide organizing processes (even though these mechanisms can be explained by the behavior of component parts) means that there are characteristics of the whole which do not apply to any part. This is true of systems at every level.

##### *Boundary*

Boundaries of systems are not always clear-cut and round like the rind of a watermelon. Sometimes they have intricate geometrical design, more like the surface of a branching coral, but even more complex than that. A naval task force maneuvering blind at sea can be a system, even though its boundary is complicated and in continual flux. It is a system organized by communications which require at least a small filament of contiguous space-time of ether, to transmit radio, radar, or other signals. When a typhoon hits the *Caine* and her sister destroyers, wiping out radio and radar contact, then the flotilla is no longer a system, because usual functional interrelationships are impossible. Communications make feasible complex organizations of systems, like the American Psychological Association or the United Nations. A given individual or behaving subsystem can, of course, be part of several systems at the same time, equilibrating at least partially with all of them. To deal with this fact the concept of "role" has been developed in social psychology.

##### *Subsystems*

How could one disprove our contention that every system except the smallest has subsystems? The answer is that if one found a homogeneous distribution of energy in any system, so that no boundary between its subsystems was discoverable, then that system would have no subsystems. How does one locate a boundary, i.e., a region where energy or information exchange is significantly less than inside or outside the system? One decides upon the order of magnitude of difference in rate



of exchange of information or energy which one will accept as indication of a boundary. Let us call this amount  $d$ . This differs according to the level of system with which one intends to deal. Then, having decided on this, one can empirically locate the boundary as that region where there is  $d$  less interchange of energy and information than either outside or inside. In general,  $d$  is progressively less from larger systems to smaller so that ordinarily it is great for societies, less for individuals, and much less for cells.

We know a good deal about the input-output relations of the peripheral sensory and motor subsystems, but it is extremely difficult with present methods to determine these relations for processes in the human central subsystems. Electronic technicians know that if there is only one subsystem between two test electrodes which contact the input and the output respectively, 100 per cent of the variance will be in that subsystem; if, however, there are two subsystems, and there is no way to put a test electrode between those systems, all the variance may be in Subsystem A; all of it may be in Subsystem B; or the variance may be accounted for by an infinite set of possible combinations of the relationships between the two. Extremely complex mathematics is required to study the input-output alterations of multiple systems whose components cannot be isolated. For this reason precise study of central subsystems of the individual—often said to be the main variables of his “personality”—presents a difficult or impossible scientific problem by present methods.

### *Coding*

In living organisms the important process of coding, which makes it possible for energy exchange also to be information exchange, is accomplished by at least three means, which are perhaps basically the same, but which for convenience can be classified as (a) instinct; (b) imprinting; and (c) conditioning or learning. The first is irreversible; the second may be; and the last is reversible. Instinct is a “wiring in” of the relationship before birth, either in the endocrine or in the nervous system. Imprinting is “wired in” before birth or hatching and stamped in by “social releasers” during early hours after birth or hatching. Conditioning or learning is usually acquired after birth, and it may be lost.

As the link between energy theory and information theory, the process of coding is of prime importance. While both the biological and the social sciences share a dual concern with energy transfer and information transfer, the predominant emphasis of the biological sciences is energy transfer, whereas that of the social sciences is information transfer. The social sciences deal chiefly with verbal or symbolic behavior. Information theory abets the union of the natural and the social sciences, but is probably more likely to be useful to the latter. General behavior systems theory incorporates most aspects of modern information theory, but it is more encompassing, for it deals with the transmission of both information and energy, and with the relationships between information and energy transfer.

Ancient philosophers, including Aristotle and Plato, were concerned with the metaphysical question of the relation of form to matter. Plato thought matter to be the feminine aspect of the universe, a “receptacle” capable of accepting any form. To him form was the masculine aspect of life, which, when united with matter, produced the real or concrete object. So reproduction could be explained, being a special case of the more general notion that any object—as we would say, any “system”—was the union of form and matter. The form could be in the head of the sculptor and he could put it into the rough matter of Carrara marble in order to fashion a bust. This form could also have been wrought in brass, iron, or other substances. Conversely, some other form, like a table or chair, could have been imposed on the marble. Together, form and matter were thought to define the object.

These conceptualizations were sheerly metaphysical until recent years, when certain empirical and quantitative discoveries have made possible a more precise linkage between these notions, bringing them closer to science.

First came the work in the late nineteenth century, which developed the second law of thermodynamics, the law of entropy. Energy ( $E$ ) and entropy ( $S$ ) were seen to have a specific relationship. Then in the early twentieth century, Einstein produced his theory of relativity which included the basic equation:

$$E = mc^2,$$



energy equals mass times the square of the speed of light.

Within the last ten years, Wiener and Shannon have written equations which connect the notion of entropy with the notion of information. The basic equation is:

$$S = -H.$$

That is, entropy equals the negative of information ( $H$ ).

What does this all mean? It has many implications, but a simple illustration might be as follows:

If an electric impulse of random character, like a lightning stroke, were to be sent over a wire and fed into a speaker, you would hear noise. A similar current passing into a television set would show "snow" on the screen. So the ultimate result of entropy, randomly distributed energy, produces noise when conveyed over a communication system to a speaker. On the other hand if a modulated current, including only selected frequencies, is conveyed over such a circuit, you will hear a tone; on a television screen you will see organized form. That is, as energy distribution becomes less random, "noise" (which in information theory is the negative of information) tends to disappear, and information tends to increase.

Anyone who has listened on a many-party, old-fashioned country telephone line knows that the higher the noise level the less the information that can get across. As noise is decreased in communication systems, more and more of the message can be conveyed.

Let us now observe the following combination of the above equations:

$$\begin{array}{l} E = mc^2 \\ | \\ S = -H. \end{array}$$

This demonstrates that there is a highly complex, but nevertheless understood, and to a degree quantifiable relationship between mass (matter or energy) and information. It is not pure coincidence that the word "form" appears as a syllable in the word "information." We find, therefore, that dimensions of energy transmission and information transmission, in some ways like the matter and form of the ancient Greeks, are in recent years for the first time quantitatively relatable.

This suggests a basic role for information theory

in general science. Information, which can be measured quantitatively in bits or similar units, can convey qualitative or formal structural aspects of any system. It can describe the nonrandom relationships in which energy is organized. Information and energy coexist as companionate aspects of every system. Perhaps this fact may lead to better understanding of the special case of the system known as the brain and the messages or information conveyed or stored in it.

As mentioned before, we are attempting to employ only dimensions and units related to the centimeter-gram-second system in quantifying all aspects of behavior, coded and uncoded. Perhaps it would be better to coin a word to represent our precise meaning and say that we employ " $u$ -units." Under this term we include: First, measures that can actually be made in centimeters, grams, and seconds, like the size of a system, its weight, or the length of its existence. In addition, we include complex dimensions of the natural sciences, whose relationships to centimeters, grams, and seconds have been demonstrated, like the temperature dimensions scaled in degrees above absolute zero. Furthermore, because we believe that equations can be written which indicate the systematic relationships between units of information and the units of energy measured by the CGS system, we include units of information like bits in our  $u$ -units.

We recognize the arbitrary nature of all coding. Almost any configuration of energy can in some language or other represent or symbolize almost anything else. However, once these code linkages are developed as traces in the brain or in the programming of an electronic computer, they are then processed according to principles of energy transformation which can ultimately be measured in the derivatives of CGS units of the natural sciences. It is of these various sorts of units we speak when we employ the phrase  $u$ -units.

We envisage a far-off scientific Utopia in which we can reduce to comparable dimensions the Oedipus complex, repression, submissiveness, physiological traces, acculturation, the pH of blood, and every other factor related to behavior. At present the social sciences wrestle with a congeries of completely unconnected terms and dimensions. It is true that factor analysis has made efforts to improve this situation. Factor analysis attempts to plot the domain of a number of dimensions whose relationships previously were unknown. When this

is done you still may not know the relationships between one domain and another, but you could presumably pyramid a whole series of factor analyses until ultimately a common dimensionality of behavior emerged, relating all the terminologies of the behavioral sciences. However, it may be more rapid and effective simply to translate these terms into the dimensions of the natural sciences. This may be true, first, because scientists have had a good deal of experience with these particular modes of measurement. Second, because use of such dimensions permits quantitative comparisons between the actions of nonliving systems and the behavior of living ones. And third, because no one is particularly ego involved with these dimensions. This is not true of most terminological systems and scaling techniques in the social sciences that often are emotionally toned for representatives of various schools or viewpoints.

Even though many of the problems of such a translation to CGS units have not yet been worked through, a few examples can be given of how some behavioral traits can be measured in such units. A phlegmatic person can of course be recognized by his usual rate of motion in space; so can a hyperkinetic or manic patient. The trait of "initiative" may be viewed as originating motion in space, and "passivity" as waiting to be moved. When one individual directs more initiative toward a second person than the latter does toward the former, the first is "dominant" and the second "submissive."

These and many other behavioral traits, however, are frequently evidenced in words and gestures. On first thought, such symbolic behavior might seem unamenable to description in *u*-units. What sorts of equilibrations in what subsystems can explain the intricate, subtle intonations, speech, and acts of a civilized man?

Let us assume that memories of past experiences are stored in the brain as traces, whose nature we do not exactly understand but which we may call "information analogs." These analogs are combined in the nervous system, perhaps in much the same way as electronic computers handle information. When this process is complete, a specific behavioral output is elicited, but this is a resultant act of a more complex process than a simple reduction of strain in a subsystem. Of course the molecular activities which transfer information analogs in the brain at cellular and subcellular levels

follow the natural laws of systems just as do electronic calculating machines. Therefore decision-making and other "higher mental processes" ultimately are explainable in terms of general behavior systems theory.

### *Equifinality*

The concept of *equifinality* advanced by Bertalanffy (3) explains purposive behavior in animals and men more effectively than vitalistic assumptions, and also more consistently with our general theoretical framework. Teleological notions of goal striving are not necessary if we accept this principle. It operates only in open systems which circumvent the effects of the second thermodynamics law of entropy, since materials necessary to create and maintain a certain organization may be selected from the input and surplus products or wastes be rejected in the output. For example consider a chemical system made up of two solutions, silver nitrate and hydrochloric acid, which when combined precipitate silver chloride. If an indefinitely large input of both substances is available and output is possible for this system, then the rate of precipitation will become constant at a specific equilibrium level. Moreover, this rate will not depend on the amounts of silver nitrate and hydrochloric acid present at the beginning of the experiment. There could be either a dram or 100 gallons of each. Rather, it depends on the solubility characteristics of the components ( $H^+$ ,  $Cl^-$ ,  $Ag^+$ , and  $NO_3^-$ ). This reaction, then, looks as if it always strives teleologically toward the same goal—that is a specific rate of precipitation—no matter whether the system at first was poor or rich in silver nitrate or hydrochloric acid. Actually, however, it is clear that this "equifinal" result is determined by the nature of the constituents of the system.

We contend that this is true of all behaving systems. Whether an infant be three months premature and weigh two pounds or be born of a diabetic mother and so weigh fifteen pounds, he will ordinarily be of normal weight a few months later. The small one will grow more rapidly than an average baby and the big one less rapidly. This may appear like vitalistic teleology, but it can be explained simply by stating that the constituents of human subsystems determine what their equilibrium levels shall be. Many of these together, in turn, fix the size of the child.

So the "goals" which "impel" the rat to run the maze, the woman to marry, and the candidate to file for public office, can be interpreted as internal strains which elicit efforts to achieve inputs of energy and information that will reduce the strains toward an equilibrium point. And no matter whether he is nurtured at court to become Pharaoh or cast away in the bullrushes, a man will search until he finds an environment with inputs capable of diminishing the particular drives within him—strains established by his genetic inputs as modified by later inputs of energy and information, by learning or acculturation.

#### FORMAL IDENTITIES

Implied throughout the above discussion is the principle that similar aspects of systems follow similar laws. Examples are propositions, to be considered in detail later, such as the statement that the growth of all systems in time is comparable within certain ranges. Or that transmissions across all boundaries involve step functions. Or that spatial spread of state throughout all systems follows comparable laws. Our attempt is to see how much of all behavior we can explain by a series of such formal identities, recognizing of course the differences or disanalogies which exist between one behaving system and another.

We must remain continuously alert to the danger of neglecting these differences, a danger which arises from the fact that a chief goal of any general theory is to recognize, describe, and measure pervasive similarities, formal identities, or analogies.

The analogy has often suffered vilification from scientists and philosophers. Still, if it is carefully employed, it is scientifically useful. Perhaps the phrase "formal identity" is more acceptable, but that term is essentially equivalent to some senses of "analogy." As clear a definition of "analogy" as any is that of John Stuart Mill, who used it as an adjective in the phrase "analogical reasoning," whose sense he formulated as follows: "Two things resemble each other in one or more respects: a certain proposition is true of the one, therefore it is true of the other. . . . Every resemblance which can be shown to exist affords ground for expecting an indefinite number of other resemblances" (7). Currently there are several ways the term "analogy" is used. One is as a statement of the subjective experience of an observer that two or more

phenomena appear similar to him or arouse in him similar feelings. This is a statement about his private experience and as such it is irrelevant for operational science. To some persons it is a purely literary term like "metaphor" or "simile," which is frequently modified by the slighting adverb "mere" and which is of artistic value to the writers of poetry and prose, but not to scientists. Another usage is a logical one, referring to a form of inference whereby it is argued that, if two or more things are similar in some respects, they will probably be similar in others, though not necessarily all others. It is apparent that there is no general agreement about the word among different disciplines. "Analogy," for example, means one thing specific to logicians and something quite different but equally specific to biologists.

Any general scientific use of the word should indicate that analogies or formal identities are the bases of all inductions which underlie scientific laws. The perception of similarity among phenomena must precede their classification. Then one can generalize, predicting that if some members of a class of phenomena are observed to operate in a certain way, so will the other members of that population, even though they have not been observed. So recognition of analogy or formal identity underlies all generalization and all science.

In modern electromechanical analog computers one can find a good example of the scientific use of quantitative analogies or formal identities. An analog computer (cf. 2) employs differing amounts of some physical quantity to match similarly differing amounts of some measurement. For example, in the differential analyzer designed by Vannevar Bush and finished at the Massachusetts Institute of Technology in 1942, a small wheel presses on a large disc, which is supported on a vertical axle running through a block. This block can be moved back and forth in a horizontal direction by turning a long screw. In the operation of the analog computer, one turn of the screw represents a certain amount of one variable in a differential equation. One turn of the vertical axle represents a certain amount of another variable. And the resultant turn of the small wheel riding on the disc represents, turn by turn, a third unknown variable in the equation. For example, if the screw represents the speed at which a train travels and the disc measures the time, then the small wheel might measure the distance traveled. Such a mech-



anism can successfully solve differential equations, even though the motions of the various parts have only analogous relationships to the variables involved. Indeed, this analogous operation represents one of the most successful—if not the most successful—way now known to solve many differential equations. Such an analog is similar to a physical model, and operations carried out on such a model can accurately quantify aspects of some comparable phenomenon of the real world.

Throughout this article the word "system" used without modifiers refers to "real" systems which exist in the veridical world of space-time coordinates. They should therefore be distinguished from formal or "conceptual" systems, which are mathematical or logical in character. The latter can, but do not always, describe such real systems. A formal identity between two conceptual systems is an "isomorphy." A formal identity between two real systems is a "homology"—a common biological concept. (A special case of homology is a formal identity between an inanimate and an animate system, like Lillie's iron wire homology of neural conduction, or Ashby's Homeostat [1].) And finally the term "model" may well be reserved for a formal identity between a conceptual system and a real system, although it is sometimes used also for homologies like Lillie's.

Generalization, or the use of analogy in the social sciences, has often bogged down in semantic difficulties. This has led to unnecessary disagreements between generalists and those concerned primarily with the special case. For example, Freud was impressed with the similarities between a number of related types of experiences which he included under his conception "sexuality." He recognized the similarity between physiological sexual gratification on the one hand, sensual satisfaction from art, music and other sensory experiences, and feelings of love and affection. In stressing these similarities in order to make a generalization, he at times neglected the differences between them, although he undoubtedly recognized them and would have acknowledged them immediately if they had been pointed out. There are theorists like Freud, concerned with making broad generalizations among dissimilar phenomena, in every discipline.

On the other hand, in every field we find persons who are concerned with a specific case, whether it be a clinical study of a specific individual or a

complete analysis of all the characteristics of the culture of a single tribe on a Pacific island. They tend to emphasize the differences between the phenomenon they study and other phenomena. However, if similarities between their special case and other such cases were called to their attention, they would be willing to recognize them.

In mathematics the relation between similarity and disparity, between formal identity and individual difference, between analogy and disanalogy, can be easily made clear. The similarity is described by a general function, like  $ax + by = cz$ . The differences are indicated by constants written into the same equation or mathematical sentence, like  $3x + 7y = 6.4z$ , which is different from  $7x + 8.5y = 17z$ .

In prose, which is the usual language of the social sciences, conveyance of such ideas is more difficult. It is ordinarily inconvenient—though possible—to construct a sentence which has as its combined subject both a similarity and a difference, both preceding the main verb. Not accustomed to such cumbersome linguistic usage, we commonly make a straight assertion of either the similarity or the difference, which results in a false bifurcation we do not intend, and we neglect the opposite consideration which we would readily admit to be true. We often proceed to the logical and emotional fallacy of committing ourselves to the importance of one and neglecting the other, and so arise many of the schoolistic battles in the social sciences.

Between any two phenomena there is an analogy, and between any two phenomena there is also a disanalogy. We hope to develop a theory in which both are recognized, the analogies by general functions and the disanalogies by constants.

Table 1 illustrates the general paradigm of how we intend to proceed. The first vertical column under "Propositions" represents one formal identity, the growth function, which within certain ranges is an exponential curve. This may be observed at all levels of behaving systems—cell, organ, individual, group, and society—and perhaps in some aspects of nonliving systems like electronic circuits. The next column represents the formal identity of boundary functions, which, as will be explained later, appear to be step functions. The third column represents a diffusion proposition concerning spread of states in space. So we might go on for many propositions which are true of all systems.



TABLE 1

GENERAL PARADIGM OF BEHAVIOR THEORY PROPOSITIONS

System Level	Unit	Propositions		
		Growth Function	Boundary Function	Diffusion Function
Cell	$\mu$			
Organ	mm			
Individual	cm			
Group	m			
Society	Km			
Electronic Circuit	From $\mu$ to Km			

On the other hand, the constants differ for each level. Growth for the cell is most conveniently measured in micra; for the organ in millimeters; for the individual in centimeters; for the group in meters; and for the society in kilometers. Similar spatial constants would at each level apply to diffusion rates, etc.

There are also other constants for different types of systems according to the materials of which they are constituted, their densities, and many other factors. There is, then, a systematic "horizontal" relationship among constants of the systems described in Table 1 which represents the disanalogy between levels, just as there is a systematic "vertical" relationship within columns, representing the analogies. The ultimate problem of predicting behavior is to learn what are the quantitative characteristics of the general laws on the one hand and the individual differences on the other, using both in a specific prediction. Such is the basic strategy of the program for empirical testing of general behavior systems theory.

This is a specific method. It does not deal in vague, poetic, or metaphorical similarities between systems which are not operationally demonstrable, like "growth" in size and "growth" in tactfulness. Nor does it simply identify comparable processes in different systems, as for example storage of information in electronic memories; traces in the nervous system; secretarial minutes of committees; and libraries of a nation. But this method does make predictions of behavior by transferring a set

of assumptions, definitions, and theorems from one class of behaving systems to another, at the same time making allowance for the distinctive specific characteristics of the systems being considered. This does not differ from the classical method of the natural sciences, from the method of Newton and many others. Newton made a real contribution in developing his laws so that they explained at once the fall of an apple from a tree, the flowing of the tides, and the revolution of the earth, even though these are vastly dissimilar phenomena. Yet such generalization can be effective only when these analogies or formal identities are recognized, even though no proper scientist may blind himself to the fact that there are also always disanalogies.

#### A CRITIQUE OF ANALOGY

What have been the common sources of dissatisfaction with analogy in science?

We have already referred to a frequent basis for such discontent—the confusion of poetical or metaphorical analogy with comparisons which are useful scientifically. Suppose that one says "He has a heart of gold." Suppose one adds that "Gold is heavy." Syllogistic logic then concludes "Therefore his heart is heavy." But this makes no operational sense. Science cannot be made from logical operations upon metaphors.

Another cause for dissatisfaction with analogy, already mentioned, is the tendency of those who generalize through analogies to neglect the obvious disanalogies. An example of this is Spiru C. Haret's book *Mécanique Sociale* (5), which appeared in 1910 and in which the author based a theory of sociology on the attraction of people to each other precisely according to the inverse square law of gravitation. It is possible that unself-critical recognition of similarities is appropriate in the initial stages of scholarly enquiry, but no scientific task can be completed until the degree of comparability is precisely determined, as well as the degree and forms of the dissimilarities. It is an interesting idea, relevant to some aspects of general behavior systems theory, that the development of societies historically has been in some ways similar to biological evolution. But a vast amount of effort has been wasted in the last seventy-five years by theorists who have compared the two without being precisely clear about the facts of both biological evolution and social process, and also without being

accurate concerning the details of how they are similar and how they differ.

Much of the criticism of analogy in behavioral science has been directed particularly at formal models like the ones we expect to incorporate into general behavior systems theory. One such argument is that models simply describe what was already known and do not reveal anything new. Certainly this is not true of all models, as for instance those concerning the learning process, which have led to the discovery of many new facts. This criticism is apt only when applied to poor models. It has been clearly shown that models are useful in natural science if they are properly employed. There is no *a priori* reason why this should not also be true in the behavioral sciences.

One often hears the comment that formal models are useful only to a limited degree in the social sciences because many of the data of those areas are not quantifiable. It may appear that such behavioral phenomena as foreign relations and politics or cultural customs and content of language are difficult to measure. But important aspects of such behavior can at least be rank ordered. If cardinal numbers cannot be used, ordinal numbers can, and this has been the first entrance into measurement of other young, complex sciences.

There is truth in the critique that the value of formal models is sometimes sharply restricted because inappropriate parameters are chosen, and consequently the relevant variables in the situation being analyzed are not made apparent. This may happen if model builders are not intimately acquainted with social or behavioral phenomena. This criticism applies to poor models and not to all models. If appropriate parameters are chosen, the model can be progressively modified to approximate more and more closely to the real system. If model builders are sufficiently informed about the phenomena that they select the proper dimensions, they can throw much light on the nature of the process they are studying.

It is sometimes said that, because of the many variables, it is more difficult to use formal models in the behavioral than in other sciences. But models have been used to study complex, multi-variant problems in the physical and biological sciences. Continually techniques are being developed to deal with such problems, including the giant electronic computers which can handle a previously unthinkable order of magnitude of vari-

ables. Precise application of a model, also, may reveal certain variables to be irrelevant which we otherwise might have considered. This can simplify the problem.

Another criticism is that models are always in error, never being precisely correct. It is hard to say how correct a model must be to be scientifically useful. The answer is that there is probably no correct model, but the goal is to find one which will explain the largest number of known facts. As further empirical data are collected and more thinking goes on, models usually are rejected and more satisfactory ones substituted. The purpose of the scientific process is to improve the goodness of fit of the model to the empirical data, that is, its predictive power. Ordinarily this is a long process of making successively better approximations. Actually models can describe complex phenomena like the social structure of a community more economically, precisely, and fully than most verbal descriptions. In addition they can suggest new variables or relationships to investigate. From models explicit predictions can be made, whereas in the past social scientists have typically made very loose predictions if they have made them at all. Furthermore, it is possible to calculate the error of the outcome of a prediction, which has not been a common social science method.

Another criticism often made of the use of models is that if you find several sorts of behavior which can be described by the same model, you have shown nothing necessarily valuable. It may be simple coincidence if you discover that the rate at which a snowball forms on rolling down hill, the rate at which a new political party picks up members, and the rate at which an audience enters a theater are similar quantitative functions. So what? The answer to this is of basic significance for general behavior systems theory. If the comparable functions are for processes which by other criteria have similar status in different systems, and if the general or "vertical" functions (cf. Table 1) in specific systems have "horizontal" constants identical to or of known relationship to constants determined for other general functions for that system, the observations have importance and are much more than coincidence.

It is sometimes said that in the social sciences, with the exception of economics and psychology, no formal models have been developed which can be helpfully applied to social phenomena. This is

not a criticism of models, as has been implied. When relevant basic assumptions are made and proper variables are selected, there is no reason why all social phenomena cannot be profitably analyzed by formal models.

Some have found fault in formal models because assumptions must be made before a model can be built. Merely adding assumptions, they contend, does not advance behavioral science. One can reply that this does not differ from the scientific method of the physical sciences. Assumptions are tested by each step of application of any model. As experiment after experiment is performed which checks the model, assumptions get more and more support, or else the assumptions or other aspects of the model are altered to include new parameters or variables, in order to predict the phenomena more accurately. This is more productive than a traditional procedure in social science, which has been to build assumption upon assumption in a complex theoretical structure, without being certain that they refer to important facts and without constantly testing them.

It is said that formal models in the behavioral sciences suffer by being caricatures of human beings, seeming to have nothing about them like the warm reality of human life. So models of the learning process seem to have little in common with the way children pick up facts in school. The only reply to this is that you cannot judge a model in terms of such appearances, but rather by its effectiveness in explaining and predicting. To the physicist, the granitic Rock of Gibraltar, for instance, is just a mass of seething subatomic particles.

To some thoughtful persons it appears that indicating similarities between either formal models or real systems on the one hand, and man's behavior on the other, can never fathom the complexities and richness of human experience. Others recognize that we ordinarily lose ability to observe objectively as the subject matter becomes more and more like ourselves. Freud realized the scientific need to allow for this effect, which in the psychoanalytic relationship he labeled "countertransference." Few antivivisectionists strive to prevent cruelty to bread molds and amoebae, but many are concerned for the welfare of cats and dogs. An earthquake on a Mediterranean isle will disturb us more than the disappearance of a moon of Jupiter, even though the latter phenomenon is much vaster. The question is whether our ego involvement with

ourselves, other humans, and organisms like us does not prevent us from recognizing otherwise obvious similarities between us and other behaving or acting systems in the universe.

One final criticism can be made of naive formal models which do not distinguish between energy transmission and information transmission or uncoded and coded behavior. This is a critique of poor models and not of all models. It is usually unproductive to compare a physical model not involving information transfer—like the oscillations of a pendulum—with a behavioral phenomenon which involves information transfer and highly symbolic components—like the swings of business cycles. Formal identities between various sorts of systems are valuable only if they make this distinction. Persons eager to advance rapidly our understanding of behavior at times manifest their impatience by hurriedly taking a model from physics or biology and applying it to human behavior. This commonly leads to unjustifiable oversimplification, particularly because information transfer is a much more significant aspect of group and social behavior than it is of physical action or biological function.

#### ELECTRONIC MODELS

Since we are concerned with quantitative formal identities among various kinds of systems, it is natural that we should be interested not only in formal models of behavior but also in homologies with electronic systems. It may someday be possible to develop a comparative psychology or sociology dealing not with animals but with electronic models. These are in some ways less adequate than animals, in that they do not have some characteristics of life inherent in protoplasm. But they are better in other ways. Greater precision is possible in quantifying their actions. Also one can manipulate their parts and alter any of their circuits quantitatively by electronic "surgery," without danger of destroying them.

The modern giant electronic computers are open systems with significantly large magnitudes of inputs and outputs. Consequently, their action is in many interesting ways like living behavior. Figure 1 depicts the chief subsystems typical of such a computer. It has two sorts of input: input of energy (the line voltage which operates the machine) and input of information (a teletype tape which



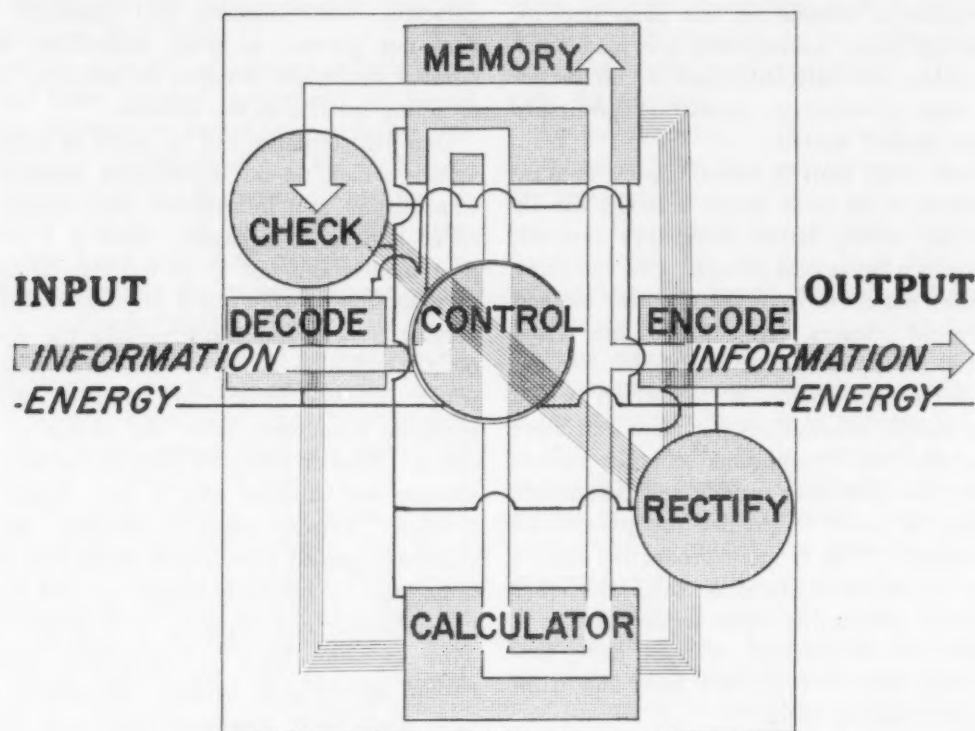


FIG. 1. Diagram of a typical electronic computer.

conveys the coded problem into the decoding subsystem of the machine). Coded data and instructions are decoded and fed electronically through the control to the memory. The control then, as directed, takes the appropriate information electronically out of the memory and puts it into an electronic calculator which manipulates voltages or other analogs of numbers, adding or subtracting (or carrying out more complex mathematical operations, all of which are derivatives of addition or subtraction). The subtotals, and finally the totals, are returned to the memory, the ultimate answers then being coded in the encoder subsystem for information output on a teletype tape or by a typewriter.

Some of these electronic devices contain internal monitoring or checking circuits, not unlike human proprioceptor or pain pathways, which transmit a "squeal signal" whenever anything goes wrong in any of the subsystems. In fact, some electronic systems can perform automatic repairing functions, replacing units or rectifying circuits when the "squeal" indicates they are worn out or operating improperly.

In individual animals and human beings these same processes occur. There is sensory input at

the boundary of the system as well as energy input, like intake of food, sunlight, water, and so forth. You also find the decoder (whatever the subsystem be that interprets speech and gesture); the memory; the internal communication system; the internal motor system; the association areas; the executive, decision-maker, or "calculator" which determines the outcome; and the output, either coded or uncoded. There are also pain or proprioception "checking" circuits, and repair or rectification mechanisms. At the level of the small group, you again find these functions—the secretary's written minutes representing one sort of memory; the chairman representing the control; and so on. Similarly in a society there are intelligence services providing information from outside; import agencies bringing in material supplies; an executive in control; an army and diplomats to provide output; and internal communication and transport services. A first step in comparing these various sorts of systems is to recognize their comparable functions. But to obtain greatest profit from the comparison, we must press further and state propositions about them which are quantifiable and testable.



## PROPOSITIONS

Several dozen specific theorems or propositions, each empirically testable at the levels of cell, organ, individual, small group and society—often for both energy and information exchange—have been derived by us or related by us to our general theoretical framework. In some cases it is clear that electronic systems can be built to which they would also apply. The testing of these propositions would involve empirical research to discover exactly under what conditions and within what ranges they do or do not apply, and what are the related variables which, when altered, change the character of the general function. Only a few of these propositions can be mentioned here.

*Proposition 1. The rate of growth of a system in a medium which has an essentially unrestricted amount of energy available for input is—within certain ranges—exponential.* How this proposition can be tested at various levels is suggested in Table 2. The formal identities mentioned in this table are assumed to exist because of a general

characteristic of all behaving systems or perhaps of all systems. An exponential growth curve appears in any expansion process in a system in which further subsystems are constantly being produced which are capable of expanding themselves or dividing into or producing other subsystems. If the newly produced subsystems could not also expand or reproduce, the total function would more likely be linear than exponential. Information transfer will probably increase exponentially in growing systems for one (or a combination) of several reasons: either (a) there are more units, multiplying exponentially, to transmit information; or (b) there are more combinations of interaction possible; or (c) if information transmission facilitates drive reduction or equilibration among the subsystems, there is exponentially more of this sort of interaction to occur. Of course a whole program of research is required to discover which, if any, of these alternatives is correct.

There are probably several shapes of exponential growth curves, differing in different classes of systems. It is also apparent that the constants in-

TABLE 2  
PROPOSITION 1: THE GROWTH PROPOSITION

System	Energy Transfer	Information Transfer
Cell	Measure the rate of growth of a yeast cell or ameba under the microscope	None thought of
Organ	Measure by repeated X ray the rate of growth of a bone or other organ in the embryo	Measure by electrodes implanted in the brain of an embryo the rate of increase of impulse transmission with maturation
Individual	Measure the volumes of embryos of different ages and plot the volumes against the ages	A broad extension of the above to the whole nervous system, together with measurement of the rate of increase of hormonal secretion will indicate the general magnitude of increase of total information transmission in the individual
Group	Measure the rate at which a crowd gathers around the goal posts to tear them down after a big football game (or around the President when he appears unexpectedly on a county courthouse lawn; or around a sudden street fist fight)	Measure in words per minute the rate at which a group of eight strangers in a European railway train compartment begin to interact
Society	Collect or analyze population growth figures to test the validity of Malthus' law	This is extremely difficult to measure because the experimental method cannot be used, and societies do not develop <i>de novo</i> , but from fragments of former civilizations. The historical method is difficult to use here because of the great differences of communication methods in different eras. Perhaps the rate of increase of message transmission across a boundary, after the end of a civil war or of the partition of a country, could be measured

volved in growth functions will differ from level to level of systems. (Cells, as we have said, grow in micra and societies in kilometers.) The growing period of cells is measured in hours and of societies in decades. Furthermore, there are species differences: hamsters grow faster than dogs. All these other considerations must be weighed in making a prediction about growth of a system.

The original proposition states that an essentially unrestricted input of energy is required if the growth curve is to be exponential. This is a limiting condition which must be stated, because of course malnourished ova, children, or societies do not grow at the same rate as those with plenty of food. Furthermore, there appear in most living systems to be mechanisms that slow growth after a period, so that this proposition obviously applies only within certain ranges. The nature of these limiting mechanisms is an intriguing question for study.

We have discussed this first proposition at a length which we cannot devote to the others. It is apparent that, while there is a rationale behind the proposition, it might be disproved at any or all levels. If it is valid, it can be valid for various reasons. The explanations may even be different at various levels, or for energy and information transmissions. But we believe it most likely that an unavoidable characteristic of all systems in space-time accounts for the formal identity we have pointed out. Only an extensive set of integrated empirical studies can reveal the facts about even this single proposition.

Let us turn, more briefly, to other propositions, any one of which raises similar complex issues and implies a major research program for its confirmation or disproof.

*Proposition 2. Greater energy is required for a transmission across a boundary than for a transmission in the suprasystem immediately outside a boundary or in the system immediately inside it.* Step-functions, whose importance for behavior is outlined by Ashby (1), are characteristic of transmission across boundaries. Neurophysiological and psychophysical threshold phenomena commonly appear to be functions of this type. At the level of the cell, more pressure is necessary to rupture the membrane than to move mechanically in the tissue fluids outside or the cytoplasm inside. More pressure is necessary to rupture a spleen or liver than to move through the space outside the capsule of

such an organ, or inside it. As we have noted, there is much work concerning thresholds for the individual. Special output of effort is necessary to join a group like a fraternity or country club, as well as to pass through customs and immigration across a border into the society of a new country. This extra physical effort or symbolic activity at boundaries can easily be measured to test this proposition.

*Proposition 3. Spread of energy or information throughout systems is quantitatively comparable.* After a transmission crosses a boundary into a system, it ordinarily diffuses. Rapoport (10) has written moderately complex probability equations describing the spread of excitation in a "random net," originally conceived as a net of interconnected neurons. Later the same type of equation was found applicable to the spread of epidemics, and the spread of information or rumors in a group or society.

*Proposition 4. There is always a constant systematic distortion—or better alteration—between input of energy or information into a system and output from that system.* Manuals issued by the manufacturers indicate the input-output "distortion characteristics" of vacuum tubes. The distortion can be determined for any electronic system, like an amplifier. A comparable alteration occurs when glucose enters a cell and lactic acid comes out. Sound frequencies pass through the cochlea of the ear and come out in volleys on the eighth nerve. A Rorschach card is an identical stimulus for many patients, but the characteristic distortions of each one result in different responses from each patient. Communication between one person and another inevitably results in distortion because these individuals are not coded identically, and for other reasons. This is often illustrated in the old parlor game when one person whispers a story to his neighbor on his right, and he to his neighbor on the right, and so on around a circle. When it gets back to the originator it is nearly always greatly altered. Likewise distortion may occur in the passage of information from one group to another, say when a report of the Bureau of Labor Statistics is interpreted first by the CIO and then by the NAM. Distortion also appears in the crossing of such massive barriers between cultures as the Iron Curtain.

Such alterations may be explained by another, interrelated proposition:

*Proposition 5. The distortion of a system is the sum of the effects of processes which subtract from the input to reduce strains in subsystems or add to the output to reduce such strains.* Though ultimately all our propositions should presumably interdigitate to form the organized conceptual structure of general behavior systems theory, at present their precise interrelationships usually are not clear. Propositions 4 and 5 are exceptions, however, for the latter suggests a measurable explanation for the process mentioned in the former. Such alteration or distortion can be explained by the fact that every system takes out of its input essentials for the maintenance of its own equilibrium, rejecting all substances that do not contribute to that steady state. This alters the output. Particular systems distort some categories of input more than they do others, because of their specific equilibratory needs. In human beings we find certain alterations in sense organs; others in perceptual areas; others in association areas; others in motor areas; and so on. The difference between the energy input which we call a stimulus and the output which we term a response is the sum of all of these changes.

*Proposition 6. When variables in a system return to equilibrium after stress, the rate of return and the strength of the restorative forces are stronger than a linear function of the amount of displacement from the equilibrium point.* To test this statement one could set up a number of experimental conditions in which the equilibrium range of a variable in a behaving system could be determined. Stimuli could then be applied to this system to disturb it a specified amount away from this point of equilibrium. The rate at which it returned to equilibrium and the strength of the forces restoring it could be measured and compared with similar measurements when there were greater or lesser degrees of disturbance from equilibrium. The characteristics of the curves for different sorts of behaving systems could then be compared quantitatively.

For example, the rate of motion and the amount of energy expended by an ameba moving out of cold or hot fluids into fluids of comfortable temperature might be measured. Or similar studies might be made of amebas moving out of acid or alkaline fluids to those of optimal pH.

At the level of the human individual, the rate of return to a position of balance and the amount of energy expended in return to it, after various amounts of displacement, could be measured. Simi-

larly, the "fire-power" of the defense employed by a player in a simplified chess game to re-establish the equilibrium of his pieces after it had been disturbed by losses of various categories of men could be measured. This would permit quantification of forces restoring equilibrium in a problem-solving situation.

At the level of social phenomena, the strength of various degrees of disturbing influences on group activity could be calculated and measures made of the rate of return to equilibrium and strength of restorative forces employed by the group to establish balance. In various experimental balloting situations in small groups, votes could be used as quantitative indices of the strength of these equilibrating forces.

Disanalogies among various species of systems as to methods of returning to equilibrium depend upon the subsystems or mechanisms of defense available to them for maintaining their study states. Amebae can swim out of an overly acid medium, but sessile forms cannot. The prisoner sings for the wings of a bird, who would be able to fly the coop he is locked in. A man recognizes the threat in an approaching tornado and takes cover, but a child may not have learned about such storms and so may be killed. However, the existence of such disanalogies does not make the general proposition less applicable.

*Proposition 7. Living systems respond to continuously increasing stress first by a lag in response, then by an overcompensatory response, and finally by catastrophic collapse of the system.* Selye (11) investigated the effects of varying degrees of many physiological stresses on the organism. He has employed such stresses as extreme variation in temperature and intravenous injections of glucose and typhoid toxoid into animals. The charts of his data, of which Figure 2 is representative, show for each stress an initial dip in the curve in the direction of the final collapse, which is the alarm reaction. It is followed by a rise of the curve above the level normally maintained by the organism, which constitutes a sort of overcompensation or overdefensiveness. As the stress is increased, more and more defenses are called into play until finally no additional ones are available and the system collapses suddenly into death.

We have collected data which suggest that coded or symbolic stresses like those in battle may well elicit response curves similar to those of Selye.



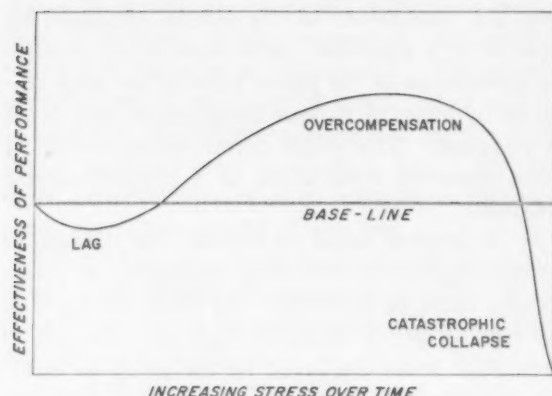


FIG. 2. Representative curve of effectiveness of performance as stress is increased over a period of time.

While extreme stress always worsens performance, moderate stress can improve it above ordinary levels. One of the tests which shows such improvement is the crossing out of C's randomly distributed in a field of O's. However, the same stress increases microtrembling of the fingers, the same fingers used in crossing out C's. It is thus clear that while finger muscle performance worsens, compensatory defense mechanisms come into play so that the total operation of crossing out C's improves. This is an illustration of how certain subsystems may develop strain under stress but the whole system compensates for it.

All this conforms with Ashby's (1) notion of a multistable or ultrastable system. An analogy to such a system is an Army cot made up of a number of wire links. Pressure on the central link will at first be compensated for by the central link alone; but as pressure increases the ring of immediately contiguous links will be called into play; then the next ring; and so on. In the end the cot can support 1,000 pounds on wires, none of which alone could carry 80 pounds without breaking.

*Proposition 8. Systems which survive employ the least expensive defenses against stress first and increasingly more expensive ones later.* In individual psychology we speak of the physiological or somatic drives, the needs for water, air, vitamins, proteins, and the like, and the psychogenic drives which are concerned essentially with the social environment, coded inputs. Either lack or excess of rate of input of either of these two sorts constitutes a stress, and the system must respond readily to defend itself against such stress if it is to maintain equi-

librium. The equilibrium is not static, as when a ball rolled up an incline returns to its original position in a trough at the bottom, but is rather the dynamic interaction of forces in flux to maintain a steady state in a rapidly changing environment, like a salmon struggling up the Columbia River to spawn.

If a continuously increasing amount of acid is injected into a dog's veins, a number of mechanisms will be brought into play to defend or protect the steady pH of the blood from this stress. The first which appears to reach its maximal effectiveness will probably be overbreathing, which produces generalized alkalosis to compensate for the acidosis. Excretion of a more acid urine than usual and the "chloride shift" from blood plasma to red cells are other mechanisms which can aid in counteracting the stress, and which probably will achieve their maximal effects later than overbreathing does. It is possible that those organisms which can survive longest under such stress are those which first mobilize the protective mechanisms that employ the most easily replaceable inputs (e.g., oxygen), and only under more extreme conditions use the mechanisms involving inputs not so easily replaceable from their environment. At any rate, this hypothesis can be experimentally tested.

A person's defense mechanisms to protect against coded, psychodynamic stresses are comparable to the physiological mechanisms, and may ordinarily be mobilized in order of their expensiveness. For example, if a man is unable to solve a problem or achieve a goal, he may lower his level of aspiration and say, "Well, I'll try something simpler." This is relatively inexpensive. The next thing he may do is rationalize his behavior, saying, "I could have done it if I had had more time." This is a little more expensive since it places him in a tactically difficult position. Someone might say, "All right, take all the time you need," and he would then be shown to be unable to do it. Repression, a yet more expensive defense, might be his next way of handling the stress if he is forced to continue working toward his goal. His "attention might turn to other things," but that would leave the unresolved strain within him, which some have said can cause psychosomatic symptoms—a serious consequence. Finally, to avoid the frustration of the unsolved problem constantly obtruding on him, he may deny the reality of his total input and a psychotic state may result which can cut him off



from close human contact and in other ways be extremely expensive to him.

*Proposition 9. Systems which survive perform at an optimum efficiency for maximum power output, which is always less than maximum efficiency.* This is a principle suggested by Odum and Pinkerton (8). They apply it to living and nonliving systems at several levels—weights on a pulley (Atwood's machine); water wheels which run grindstones; electric batteries which charge other batteries; metabolism; animal food capture; photosynthesis; a plant community; and a civilization. This principle applies to all systems the notion of efficiency from physics or economics, and the concepts of survival from evolutionary theory. It questions the traditional view that the most efficient system survives and suggests that this is true only if, on occasion, it can also put out maximum power. It also broadens natural selection theory to apply to all systems under stress in a changing suprasystem, from cells, organs, and individuals through groups like clubs and corporations to societies which, like Rome, can fall. Unless in a battle an animal can, by an "emergency reaction" like that described by Cannon, transfer blood flow temporarily from the gut to the extremities, he will fight less well and blood in a cut will clot less effectively. This is directly related to survival. Also, if the cooks in an army under attack, as in the Battle of the Bulge, are not permitted to leave their stoves and pick up guns to aid in a maximum effort, the army may not survive. Throughout all these examples runs a single principle.

*Proposition 10. When a system's negative feedback discontinues, its steady state vanishes, and at the same time its boundary disappears and the system terminates.* At this moment it becomes part of a larger system which is its environment, and at the same time divides into several subsystems. This hypothesis mentions two independent variables which can be measured separately. One is the degree of negative feedback or the steadiness of the equilibrium in the system; the other is the permeability of the boundary. If too much water enters a red cell, it will swell up and eventually rupture. It can be demonstrated physiologically that the osmotic equilibrium within the cells disappears at about the same time that the cell membrane ruptures. Separate molecules of the cells then become small systems in the much larger sys-

tem of the circulating blood. A similar sequence occurs in physiological death. It may also occur in the breakdown of psychological defense mechanisms. Certainly a comparable process is seen when a committee dealing with a practical problem cannot agree. It finally dissolves, the members dispersing while the next larger organizational unit, which set up the committee, takes over the responsibility for settling the issue.

*Proposition 11. The dimensionality of the output of a system is always less than the dimensionality of the input.* This principle is derived by Platt (9) from electronic amplifier theory. Amplifiers are systems which increase the volume of a specific output, but along with amplification there is always selection or discrimination. For example, a high fidelity phonograph amplifies only certain vibrations of the needle in the groove. It does not amplify the motion of the pick-up arm, the light in the room, the temperature of the room, the pressure of the air, the line voltage input, or many other variables in the input to the amplifier from its environment. Consequently the dimensionality of its output involves fewer variables than its input. This is true of sense organs. It is also probably true of any individual, group, or society which makes decisions among options and follows one rather than another, for selection and amplification always go hand in hand.

*Proposition 12. Decentralization of the maintenance of variables in equilibrium is always more expensive of energy than centralization, although it can increase utility (i.e., the rate of strain reduction).* This is an example of the group of propositions that combines economic concepts with other behavioral notions.

*Proposition 13. As decentralization increases, subsystems increasingly act without the benefit of information existing elsewhere in the system.*

*Proposition 14. The more subsystems there are in efficient systems, the more variables they can maintain in equilibrium, but there are also proportionately more subsystems whose destruction will result in collapse of the system.*

*Proposition 15. The equilibratory range of a system for a specific variable increases proportionately to the amount of storage of the input in the case of a lack strain along that variable, or spillage of the input in the case of an excess strain.*

*Proposition 16. When reduction of several strains is not possible simultaneously, the order in which they are reduced in systems which survive is from strongest to weakest, if the effort required for their reduction is identical.*

*Proposition 17. There is a range of optimal rates for development of coding. If it develops too rapidly, the system cannot properly equilibrate to the probable variations in input; if it develops too slowly the system cannot profit adequately from past inputs.* In other words, since the environment varies somewhat, two events may not always be associated tomorrow as they were yesterday. One-trial learning would lead to the rigid and maladaptive expectation that they would be. On the other hand a system that never learns from past experience cannot adapt so well as one that does. The optimum learning rate for adaptive systems that survive is somewhere between these two.

*Proposition 18. Up to a maximum, the more energy in a system devoted to information processing (as opposed to metabolic and motor activity), the more likely the system is to survive.* In general evolution appears to have resulted in the more complex species having more and more of their total cells devoted to information collection and processing, e.g., larger and larger nervous systems. No one has yet demonstrated a species which failed to survive because too much of its total mass was neural tissue.

*Proposition 19. When one living species (the predator) feeds on another (the prey) in a given suprasystem and both species continue to survive, an oscillation of numbers of predators and prey occurs around an equilibrium point.* This is the cat-and-rat farm situation, or the ecological problem of foxes and rabbits. As the foxes increase in number they eat more rabbits. As the rabbits decrease in number, there is less food for the foxes and so fewer of them survive. Then rabbits rapidly become more numerous. When cells or organs or individuals of other species compete for food, or oxygen, related phenomena are observed, of which this is a special case.

These, then, are a few illustrative propositions. Some may be correct; others may be wholly wrong; still others may require modification. To test all of them at all levels would be a vast empirical program. We intend to embark on it piecemeal, re-

alizing that the waters are murky and full of shoals, and that our vision is limited. We shall try it, though, because of the alluring distant shore of an integrated behavior theory.

#### THE ROLE OF SUBJECTIVITY

All of this discussion has dealt with publicly observable evidence. Some readers will have wondered about the place of subjective experience in all this. This traditional enigma is too important to avoid entirely—we cannot in day-to-day life deny our subjectivity. Since operational science yields no relevant facts, we can only state a belief about this issue—a belief that the most satisfactory solution seems to be Whitehead's. He contended (12) that there is a subjective pole to all phenomena occurring in each subsystem and system. In complex living systems we recognize this as experience. Its character in simple systems is unimaginable to us—less comprehensible than the "blooming, buzzing confusion" of James. In order to have experience continuous over a period of time, all the equilibratory mechanisms which add up to what we call the behavior of the individual, the group, or the society are essential. The concept of responsibility in the law—for example, in the law of torts which concerns damage of one's boundary or limitation of one's input or output, or the law of contracts and civil rights which guarantees coded inputs and outputs—depends on the morality that we may not destroy the equilibrium of other systems which we suspect are experiencing as we do. Social systems remain organized because they are capable of handling larger numbers of stresses and maintaining the experience of all their members more adequately than any individual can. It may be that ultimately, through having explained behavior scientifically, we can understand the processes which enable each of us to maintain his experiencing subjectivity. And, by application of our findings to living and nonliving systems at various levels, we may be able to improve the external human and nonhuman conditions which provide satisfaction in experience. This ultimately is what makes the behavioral sciences important.

This article is an affirmative statement of a general position. Very many aspects of so vast a problem obviously cannot be considered in such short space, so in many ways it is incomplete. An effort is made to embrace core subject matter from several biological and social sciences, including such

notions as natural selection, efficiency, homeostasis, and other powerful concepts which appear to have cross-disciplinary implications. Obviously no approach to a general theory of behavior at present could encompass even a small percentage of the phenomena which must be considered. The negative criticisms of this view could consume as much if not more space than this positive presentation. As we have observed earlier, models and theories are never perfect but simply approach the limit of correct explanation, and another theory that explains more than this will probably appear soon and should properly supplement this one. At the moment we have only a sketchy map which perhaps shows the route to a first approximation of a general behavior theory. Only a program of empirical testing such as we are now undertaking can demonstrate how much value, if any, it may have.

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## SOUTHERN REGIONAL MENTAL HEALTH PROGRAM FOCUSES ON DEVELOPMENT OF TRAINING AND RESEARCH

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THE American psychological profession is taking a leading role in the nation's first regional program to improve mental health and combat mental disease, which the Southern Regional Education Board is conducting. With the organization of the Southern Regional Council on Mental Health Training and Research in Atlanta on July 11-12, 1955, the program reached the operational stage following 18 months of surveys and planning. The sixteen states of the Southern Governors' Conference<sup>1</sup> participated in the preliminary activities and are represented on the Council, which will advise the Board on policy for the program. Five of the states have made funds available, at the rate of \$8,000 each per year, to support it. The others are expected to join these over the next two years, as legislatures meet. In the meantime the National Institute of Mental Health has granted funds to the Southern Education Board to put the program in full operation.

The Southern program is attracting national attention as the model for regional action in other parts of the country. The far Western states have already undertaken preliminary surveys, and both the Midwestern and the Northeastern groups may follow suit. The Southern Regional Education Board activity is also of general interest as a demonstration of teamwork not only by the several mental health professions and the related sciences but also by political leaders, administrators of mental health departments and institutions, university faculties, and citizens' groups. Their unanimity in focusing the program on the development of training facilities and of research, particularly in psychiatry, psychology, psychiatric nursing, and psychiatric social work, promises long-range results of great value to the region and to the country.

The program has grown with extraordinary verve from a request of the 1953 Southern Governors'

Conference that the Southern Regional Education Board undertake the studies needed as a basis for regional action. The results of these studies were presented to the governors at their 1954 meeting, at which they endorsed the proposals for the program now under way.<sup>2</sup> The Board conducted its studies with the aid of a grant from the National Institute of Mental Health. Nicholas Hobbs served as project director, and the Board appointed an advisory Commission on Mental Health Training and Research with Governor Frank G. Clement of Tennessee as chairman. The Commission agreed that the objective should be to assist the states "to strengthen their programs of mental health through increasing the number and quality of personnel and the scope and quality of research which will contribute to the solution of mental health problems."

The Commission assigned priority to the assessment of training and research in psychiatry, clinical psychology, psychiatric nursing, and psychiatric social work. It felt that time permitted the study of services in these fields only as they pertained to training and research. It insisted, however, that the behavioral and biological sciences related to mental health, including experimental psychology, should be surveyed. The work of the Southern Regional Education Board Council on Psychological Resources in the South, chaired by M. C. Langhorne, has been planned to supplement the psychological aspects of the mental health program. In addition the Commission asked that statements of at least a general sort be prepared on the problems of training and research in occupations and professions related to mental health, such as medicine, social work, the clergy, teaching, and so on.

The Commission relied on state survey committees, appointed by the several governors, to de-

<sup>1</sup> The states are Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

<sup>2</sup> Cf. *Mental Health Training and Research in the Southern States, A Report to The Southern Governors' Conference* (Atlanta: Southern Regional Education Board, 1954).

fine the responsibilities for execution of the project.<sup>3</sup> These committees, composed in most cases of a nucleus of professional people, and a larger group of citizens representing a variety of interests in mental health, reserved to themselves the entire conduct of the surveys. They requested, however, that the project staff develop necessary questionnaires for the sake of uniform reporting.

Accordingly six schedules were prepared. The first schedule covered mental health institutions and agencies; the second covered departments of psychology; the third, departments of psychiatry; the fourth, schools of social work; and the fifth, schools of nursing. The sixth schedule was devoted to university departments doing basic mental health research and included parts which were filled in by graduate deans, department heads, and individual investigators.

The project staff also conducted a series of "technical panels" on the theoretical aspects of state mental health programs. The panels, whose membership was national in scope, prepared in addition the statements on needs for training and research in the professions and occupations related to mental health. Reports of their discussions served to plot the horizon of the project and to balance the local and statistical concerns of the state committees.

The most inclusive of the panel reports deals with the basic assumptions of mental health training and research. It argues that investment in training and research is the most economical and

humane response to the problem of mental illness. The panel thought that mental health programs should be conceived as involving the application of the behavioral and biological sciences. It recommended that mental hospitals be regarded as medical treatment and rehabilitation centers, operated as parts of systems including the community's health, welfare, rehabilitation, training, and educational resources. People in need of treatment for mental disorders should be admitted to such systems at places appropriate to their condition, thus enabling the several units of the systems to concentrate on their appropriate functions. The present program's emphasis on research stems in part from the work of this panel, which hoped that research might be conceived "in broadest terms with maximum freedom for the play of intelligence" and that substantial portions of state funds would be attracted to it.

By late spring, 1954, the state committee reports had provided the most accurate and detailed picture we have ever had of the needs and resources in mental health training and research throughout a large region. They spelled out the staggering extent of the states' present problems of mental health and projected their situation into the next two decades. One conclusion was that the South will have to quintuple the rate at which it produces specialists in the several fields within ten to fifteen years. With respect to clinical psychology, it was found that the 16 participating states, with over 30 per cent of the country's population, have only 12 per cent of its clinical psychologists. There are eight doctoral programs in clinical psychology, whose annual rate of production is less than the number of budgeted positions now vacant in the region.

The state committees agreed that the need for new knowledge is as acute as the personnel shortage. They felt that the Southern states cannot hope to reduce the financial and social costs of mental disorders in any telling way without finding treatments capable of mitigating or wiping out such dominant disorders as schizophrenia and the psychoses of old age. Although many Southern investigators are productive, the Southern Regional Education Board project concluded that the region does not do its share of the nation's total research job. Lacking research personnel and facilities, the South does not receive a full share of research funds from outside the region. Perhaps the most

<sup>3</sup> The chairmen of the state survey committees were: Dr. Frank A. Kay, Professor of Psychiatry, Medical College of Alabama; Dr. E. H. Crawfis, Superintendent, State Hospital, Little Rock, Arkansas; Dr. M. A. Tarumianz, Superintendent, Delaware State Hospital, Farnhurst; Dr. Paul Penningroth, Director, Division of Mental Health, Florida State Board of Health; Dr. Carl A. Whitaker, Professor of Psychiatry, Emory University; Dr. Frank A. Pattie, Professor of Psychology, University of Kentucky; Dr. Edward D. Grant, Director, Department of Institutions, Louisiana; Dr. Paul V. Lemkau, Professor of Public Health Administration, Johns Hopkins University; Dr. D. S. Pankratz, Dean, School of Medicine, University of Mississippi; Dr. George C. Ham, Professor of Psychiatry, University of North Carolina; Dr. Hayden S. Donahue, Director, Department of Mental Health, Oklahoma; Mr. G. A. Buchanan, Chairman, South Carolina Mental Health Commission; Dr. Cyril J. Ruilman, Commissioner of Mental Health, Tennessee; Dr. Frederick C. Elliott, Executive Director, Texas Medical Center; Dr. Joseph E. Barrett, Commissioner, Department of Mental Hygiene and Hospitals, Virginia; and Dr. Newman H. Dyer, State Director of Health, West Virginia.

far-reaching decision which came out of the project was to step up the entire research activity of the 16 participating states.

This decision among others was formulated by a region-wide conference which met in July, 1954. Joint planning sessions of the Commission and the chairmen of the state survey committees made it possible to adjust differences of viewpoint and agree on the chief aims of the conference. The result was that the conference was able to render a coherent program from the complex data of the state surveys.

The conference assumed that, even if it were possible for each state to develop training and research in all of the mental health specialties, the attempt would be extravagant and produce inferior programs. The interest of each state requires that it concentrate on certain programs, which it can make available to other states in return for access to complementary programs. None of the states could initiate programs without calling on the others for people to staff hospitals, clinics, and faculties. Consequently the conference felt that it would be to the interest of each state to have strong regional centers for training and research.

The South already has centers of relative strength at such places as Baltimore, Durham-Chapel Hill, Louisville, Nashville, and New Orleans. These could, with adequate support from the region as a whole, provide distinguished training for the South and attract students from the world at large. In research also the region has centers which the conference felt should be cooperatively supported and expanded. Maryland, for instance, is well equipped for psychiatric and public mental health research. Centers exist in North Carolina for statistics and social science; in Florida for gerontology; in Louisiana for schizophrenia; in Oklahoma for psychosomatic medicine; and in Tennessee for mental deficiency.

The recommendations of the conference have become the guide lines of the developing Southern Regional Program of Mental Health Training and Research. It was recommended (*a*) that the states should increase appropriations to their universities and agencies which prepare mental health personnel and which can do mental health research; (*b*) that the states which need trained people but lack training facilities should consider meeting their need through regional arrangements with other states or universities which can provide training opportunities; (*c*) that the states should jointly

encourage the growth of regional mental health centers; and (*d*) that the states should establish the Regional Council on Mental Health Training and Research and support the regional program by special appropriations.

The participation of the minimum of eight states required before the program could go into operation is now assured. The participating states will get advice and consultation through the program to make sure that what they are doing represents the most effective use of available resources. The program will include support of institutes and conferences among state representatives on mental health training and research. It will provide a clearing house for information on new methods and on activities either in progress or in prospect throughout the region. An important objective will be to work out interstate arrangements, for example, between states which are producing trained people and other states or agencies which can provide placements for residencies in psychiatry, internships in psychology, or field work placements in social work. Region-wide recruitment drives will be launched to bring more qualified students into the mental health specialties. If the member states desire it, the program will also include fundraising efforts in the hope of financing research in the sciences related to mental health, experimentation in methods of training mental health personnel, and student fellowships.

The formation of the Southern Regional Council on Mental Health Training and Research and the employment of staff members by the Southern Regional Education Board to carry out the program signal action this fall. The Council, which is chaired by Dr. Frank M. Gaines, Commissioner of the Kentucky Department of Mental Health, is composed of state representatives appointed by the several Southern governors and representatives of the Southern Regional Education Board appointed by its director. The membership reflects the broadly based public and professional interest in the program.<sup>4</sup> The professional staff will take

<sup>4</sup> The Council Members are: Dr. Joseph E. Barrett, Commissioner, Department of Mental Hygiene and Hospitals, Richmond, Virginia; Miss Marjorie Bartholf, Dean, School of Nursing, University of Texas; Mr. G. A. Buchanan, Jr., Chairman, South Carolina Mental Health Commission; Dr. Edward D. Grant, Director, Department of Institutions, Baton Rouge, Louisiana; Mr. A. N. Florentz,



over in a remarkably auspicious atmosphere of agreement, not only on immediately practical needs

Chairman, Board of Directors, Arkansas Children's Colony; Dr. Frank M. Gaines, Commissioner, Department of Mental Health, Louisville, Kentucky; Honorable J. R. Hall, Jr., Member, House of Representatives, Miami, Oklahoma; Mr. Paul Harkey, Governor's Office, Oklahoma City; Dr. Nicholas Hobbs, Chairman, Division of Human Development and Guidance, George Peabody College; Mr. C. Seth Hudspeth, Executive Secretary, Board of Trustees of Mental Institutions, Jackson, Mississippi; Dr. N. H. Dyer, State Director of Health, Charleston, West Virginia; Dr. Paul W. Penningroth, Director, Division of Mental Health, Florida State Board of Health; Dr. Hildegard E. Peplau, Assistant Professor of Nursing, Rutgers University School of Nursing, Newark, New Jersey; Dr. Clifton T. Perkins, Com-

and expedients, but also on the fundamental importance of pure research and training as the keys to the states' mental health problems.

missioner, State Department of Mental Hygiene, Baltimore; Mr. Roy M. Purser, General Business Manager, North Carolina Hospitals Board of Control; Dr. William C. Rhodes, Acting Director, Division of Mental Hygiene, State Department of Health, Atlanta, Georgia; Dr. Cyril J. Ruilmann, Commissioner of Mental Health, Nashville, Tennessee; Dr. John R. Seeley, Director, Community Surveys, Inc., Indianapolis, Indiana; Dr. M. A. Tarumianz, Superintendent, Delaware State Hospital; Honorable George C. Wallace, Judge, Third Judicial Circuit, Clayton, Alabama; Dr. Ernest Witte, Director, Council on Social Work Education, New York; and Mr. Whitney Young, Dean, School of Social Work, Atlanta University, Atlanta, Georgia.

## INTERNSHIPS VS. FIELD TRAINING FOR INDUSTRIAL PSYCHOLOGISTS

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*The Procter & Gamble Company*

THERE is little or no argument regarding the desirability of work experience as a vital part of the training of industrial psychologists. The problem for consideration is how best to provide means for obtaining work experience for such men. I should like to discuss the merits of a work-centered program, which might perhaps, for want of a better name, be called "field experience." I am opposed to the idea of internships for industrial psychologists.

Internships undoubtedly have merit under teaching, medical, and governmental auspices; or under the unique arrangements provided by The Psychological Corporation and the Social Science Research Council. "Intern" is not a recognized job classification term in industry, primarily because the usual business executive is now concerned with *on-the-job training of employees*. Work experience, as a company employee, today seems to offer greater advantages than an internship program.

A satisfactory training program for psychologists in industry will evolve only when good applicants present themselves, are hired, and demonstrate that they have special assets for industry. The company with which I am associated has employed 28

men with degrees in psychology since 1929. Ten of these men hold PhD degrees in psychology. Four currently are employed by the company. Today we have men with psychological training serving as personnel managers, foremen of operating departments, employment interviewers, staff training specialists, and personnel research workers. These men did not hold internships. Instead, they acquired their industrial experience on the job. I wish to recommend that plan as a proven procedure for inducting young psychologists into industrial jobs.

I suggest that it is better to take advantage of opportunities for training that now exist in industry than to try to sell industry on the merits of internship programs. It is my observation that few industrial organizations feel the need for psychologists on their staffs to the degree that they would be willing to set up special inducements under the guise of internships to lure into industry men who have not developed sufficient interest in industrial activities to apply for work on their own initiative. Employees within the plant gates, even if hired for temporary work, have met selection standards that are considered important. An "in-

tern" may be an individual who was selected by the sponsor of the internship program. He may not be at all acceptable as a person, or as a possible future employee, at the plant whose facilities are made available for the period of internship. Usually the company has no authority over the intern comparable with that exercised over employees. Company time and facilities are made available for instructional purposes. This is costly. Managers may well wonder how they would justify the expense of such a program unless it were approved by the board of directors of the company.

A productive program designed to induct young psychologists into industry must consider the needs of two groups: (a) undergraduate majors in psychology who are available for part-time or summer employment; (b) men who hold bachelor's, master's, or doctoral degrees in psychology. Industry needs, and can absorb, able men with all degrees of training.

The job induction program of the industrial psychologist should not differ from that of other college men employed by the company. After selection, he should be placed in an operating department where on-the-job training is the direct responsibility of a supervisor. The new man should be given responsibility just as rapidly as he is able to take it.

The best period for the young psychology major to begin acquiring work experience, habits, and attitudes is during the summers, while he is an undergraduate. The early association with adults in a supervised work situation will be of primary value if he chooses an industrial career. The viewpoints and attitudes acquired in industry will be of immeasurable help if the man decides to become a teacher or counselor.

Many industries recruit college men between the junior and senior year and give them field experience in the form of summer jobs in order to observe them for several weeks before deciding whether or not to offer permanent employment following graduation. The advantage to the young college man is that he is engaged in useful work for which he is paid the going rate. It gives him field experience under supervision. For the employer, this is a period of pre-recruiting.

Summer jobs in industry are publicized by employers in the college placement offices whose services are available to all students. Although the information regarding summer jobs is readily obtain-

able, it is very rare for interviewers from industry to have a psychology major apply for summer work. This may be due either to lack of interest in this type of field experience on the part of psychology majors, or an attitude fostered by professors that the professor, through his contacts, will locate a job for the student.

In the spring of 1954, when representatives of our company interviewed 1,063 college students at 26 colleges to select summer employees, only two psychology majors made inquiries about jobs which paid \$300 per month, plus round-trip transportation. The 66 men who were hired were enrolled in fourteen different courses of study. Fifty-nine per cent of these summer junior trainees in 1954 received offers of permanent jobs available after graduation. In 1955, college graduates holding bachelors' degrees will receive \$385 per month; men with masters' degrees will start at \$425.<sup>1</sup>

Summer work for undergraduates may take the form of assignment to a regular job within the capacity of the student or he may be asked to gather data on several problems that involve visiting various departments and conferring with foremen, supervisors, and superintendents. In this way the student has the maximum opportunity to see the operation of the work, and a number of supervisors and superintendents have a chance to get acquainted with him, and rate him as a potential future employee.

Summer job opportunities should not be reserved exclusively for undergraduates. When suitable candidates are available, it is not unusual to employ graduate students for summer work in a laboratory or factory. For example, during the summer of 1954, we employed five graduate students who are working for PhD degrees in chemistry. No psychology graduate students were employed. Most probably some of these chemists will be interested in permanent employment with the company after their degrees are conferred.

Graduate students should not view a summer job as a chance to conduct an in-plant survey or experiment. It should be recognized for what it is—

<sup>1</sup> In the spring of 1955, recruiting visits were made to 55 colleges where 1,619 men were interviewed for summer jobs which paid \$325 a month plus round-trip transportation. One hundred thirteen men were employed. Nine psychologists were interviewed; none was hired. However, during the year 1954-1955, two psychologists joined the company on a full-time basis.

an opportunity to participate in work experience alongside other young men who expect to follow industrial careers. The problem is to learn what goes on in industry by participating in some of its activities as a worker, rather than as a student. Industry is prepared to give much valuable assistance to the man who is work oriented.

The man who has completed his theoretical training in psychology, and who holds a bachelor's, master's, or doctoral degree, presents an altogether different problem, insofar as induction into an industrial job is concerned. It is proper to ask the question, "What is best for the man at this stage?" Assuming that the psychology major is genuinely interested in following a career in industrial psychology, my first suggestion would be that he get his own job. This entails finding out about job opportunities and interviewing schedules. It presupposes that his major professor will encourage him to act as a mature adult and solve his own problems. He should get experience as an applicant. This involves learning how to be interviewed. I doubt if very many men have received job offers following their first experience as an applicant. It is important to learn that getting a job involves competition with a dozen or more men who also are interested in making a connection with a particular company. The man who has his first job handed to him through a professor's contacts is robbed of a developmental experience.

After the psychologist is hired, his employer has an obligation to put him through an appropriate orientation and training course for the work he has been selected to perform in the company. At that point he is not an intern, but a fully accepted employee, which, after all, should be the goal he wishes to reach. This does not mean, however, that the newly hired college graduate is fully productive at the start. It is not unusual for an employer to invest \$5,000, or more, in the selection and on-the-job training of a college graduate. This fact alone makes it highly unlikely that many employers would be interested in providing one-year internships for men who expect to return to college to complete graduate requirements. The employer is interested primarily in adding permanent employees to his staff and in giving them adequate training to do their jobs.

Let us look at the experience of a company that has hired approximately 2,700 college graduates for work in its manufacturing department since 1887.

If a young psychologist were employed by that company today, he would find himself associated with college graduates who hold 79 different degrees, conferred by 217 colleges. The BS degree men make up 77 per cent of the group. Sixteen per cent hold master's degrees, and seven per cent have doctor's degrees. All of these men were trained on the job.

As a preliminary to getting a job offer, the psychologist most probably would be interviewed, on the college campus, by a company recruiter. His training, interest in industrial work, and energy would be evaluated.

If the candidate impressed the interviewer favorably, he would be invited to visit the manufacturing headquarters of the company for a plant visit and a series of interviews. Line and staff executives, as well as psychologists, may participate in the interviewing at this stage.

It would be explained to the job applicant that, even though he may be interested in some phase of personnel work, his first job assignment would not be in a personnel department. If he is employed, he would be assigned to a factory for at least a year, to work in an industrial engineering group or in a factory operating department. His status would not be that of an observer. He would be given on-the-job training for a specific job. He would be expected to make a success of his work on the same basis as other college graduates employed by the company.

If his first assignment were in an operating area, he would be a "foreman in training," learning the key jobs in the department. At the end of about six months he would be made foreman of the department, which might have as many as thirty people in it. He would be responsible for scheduling work and cost control. He would handle employee problems and grievances, just as other foremen do.

After a year of factory operating experience, the young psychologist then would be ready to be transferred to a factory personnel office, or to the central personnel division in the manufacturing department of the company. He would have won recognition as a factory man who knows the problems of employees and members of supervision. As a personnel man, most probably he would deal, first, with selection and training problems. Later, if his interests developed in that direction, he might handle some phases of labor relations or personnel



research work. A recent PhD in psychology, after a year of factory on-the-job training, is now doing college recruiting. Without prior industrial experience, or internship of any type, he has been successful in making the transition from student to employee status.

In a manufacturing environment the experience of a quarter of a century (with a great variety of college graduates including psychologists) indicates that internships for industrial psychologists are unnecessary.

Psychologists who are primarily statisticians, interested in test theory and construction, have little difficulty in adjusting to assignments in fields such as personnel research or market research, particularly if they are trained in the use of modern tabulating and computing equipment. The number of such jobs is relatively small. Here again, on-the-job training is the rule, rather than the exception. The problems the men work on are set because the employer needs the answers. The primary purpose of the assignments is not to provide training exercises for internees, but to get the work done. Concurrently, the men perfect their job skills.

It has been said repeatedly that the job opportunities for psychologists are unlimited. Employers are very much interested in hiring scientifically trained, mature college graduates, who will adapt themselves to the current situation. They are surprisingly liberal in supporting job training pro-

grams, specially designed to meet company needs. At present, they are not receptive to the proposals of the professor who says in effect, "Accept my student as an intern; arrange for a suitable problem, hold seminars and conferences for his benefit, and provide opportunities for discussion of psychological problems with company executives."

The employer may not voice his objections to an internship program, but he may be thinking, "An internship program probably is necessary to train hospital personnel or teachers. However, my experience indicates that we have been fairly successful in employing young engineers, liberal arts and business administration graduates, and training them on the job. Why should a psychologist feel that he needs a period of 'internship'? Isn't that a sign of professional immaturity? Why can't he complete his college work, get a job, and start working just as other college graduates do?"

An internship can be described as a weaning period, during which the student is spoon-fed until he is ready to stand on his own feet and assume his responsibilities as a full-time wage earner. Few industrial employers are interested in weanlings. It is appropriate to point out that graduates of departments of economics and mathematics, as well as those of other liberal arts departments, are able to find industrial jobs without the aid of internships. Psychologists should be competent to do likewise.

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## RELATIONSHIP BETWEEN PERSONAL INSECURITY AND ATTITUDE TOWARD PSYCHOLOGICAL METHODOLOGY<sup>1</sup>

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IT IS intriguing to speculate about how a scientist's personal needs may affect his theoretical orientation and the kind of research he does. Karl Mannheim, in his *Ideology and Utopia* (6), came to the conclusion that every scientist is biased in his research activities by his own personal problems. Mannheim feels that the scientist who is busy trying to solve research problems is actually

engaged in a quest to order his personal world and to bind up his own anxieties about the unpredictability of things. Kubie (5) takes a viewpoint similar to Mannheim's. He feels, on the basis of his clinical observations of various researchers, that in many cases they are seeking to work out private conflicts in their scientific activities, and that their own difficulties may dictate the areas in which they "choose" to do research and the meaningfulness of their results. Anne Roe's (8) work has lent some

<sup>1</sup> Presented at the meetings of the American Psychological Association, New York, September 1954.

substantiation to this viewpoint in certain of the results from her investigations of noted scientists. In reading through the biographical data she obtained from these scientists one cannot but be impressed with how frequently their choice of scientific research as a vocation followed a long period of soul searching and looking for answers. They suddenly seemed to see in research activity a way of finding these answers. In some instances there was almost a religious conversion aura about their choice of research as a life activity.

However, Shaffer (9) has recently reported results which do not support the speculations of Mannheim and Kubie or the deductions from Roe's data. Shaffer mailed questionnaires to several hundred psychologists and determined by means of an attitude scale the degree to which each psychologist was "intuitive" or "objective" in his approach to psychological phenomena. He also analyzed the relationships existing between degree of objectivity-intuitiveness in outlook and numerous biographical variables. He concluded that the psychologist's orientation along the intuitive-objective continuum did not seem to be significantly influenced by personality factors, but rather seemed to be a function of the kind of training the psychologist had received.

This whole problem area is shrouded in vagueness. We felt that one way of clarifying the problem would be to examine the question of whether a man's thinking about his science can become so enmeshed with his personality needs as to be shaped by them. We hypothesized that when a man chooses to work in a given science he does so because consciously or unconsciously he sees it as a way of gaining important life goals. We further assumed that once an individual has made such a choice the data and methods of that science begin to take on personal, even irrational, meanings to him. With the above assumptions in mind, it was postulated that one should find a significant link between an individual's personality needs and his orientation toward a science area if he has chosen that area as his life's work, but that such a relationship should not be found among those who are only peripherally interested in that science. The present study was designed to test these assumptions on a miniature scale by observing how well they applied to an experimental group consisting of persons involved in psychological work.

The experimental group consisted of 51 graduate

students in psychology, 40 men and 11 women, who were actively working toward the PhD. Approximately half were students at the University of Texas, while the remainder attended the University of Houston. The control group comprised 51 undergraduates, 41 men and 10 women, who were not majoring in psychology, but who were members of a general psychology class at the University of Houston. They were considered to be significantly less ego involved with psychology than the subjects in the experimental group.

Each subject's attitude toward psychological methodology was evaluated on an objective-intuitive continuum very similar to that used by Shaffer (9) in his study. The intention was to determine to what degree the subject felt that psychological methods and procedures should be precise and objective as contrasted to loose and intuitive. This attitude area was sampled by having each subject indicate his agreement or disagreement with 21 listed statements. The subject's score was equal to the total number of instances in which he indicated his approval of the objective approach or disapproval of the intuitive.

Because of certain hunches suggested by clinical observation, *level of personal anxiety* was selected as the personality variable likely to have important influence on the objectivity-intuitiveness attitude. Clinical observation suggests that many highly anxious individuals try to control and hide their anxiety by engaging in superformalistic and precise behavior. Illustratively, their responses to the Rorschach test are couched in terms of scientific concepts or defined with exaggerated precision. In these instances the individual's anxieties drive him to a caricature of some of the behaviors involved in scientific work. This suggested the possibility that the scientist pressed by anxiety might similarly take refuge in the symbols of objectivity so easily available to him in his science. The measure of anxiety was a semiprojective technique devised by the present writers for a previous study (3). It consists of a series of eight pictures, each depicting an ongoing activity. Each picture was so drawn as to give some potential cue for assuming that the ongoing activity was one in which an individual had lost control over himself, or one in which some object had in a dangerous fashion become uncontrolled. The scoring system for this test was described in the study mentioned above.

The analysis of the data was designed to de-

termine if those high and those low in attitude objectivity within each of the groups differed significantly in level of personal anxiety. The analysis proceeded as follows: The experimental and control groups were combined and the median attitude score of the combined group determined. This median score was then used as a cutting point to split each of the groups into a high objectivity subgroup and a low objectivity (intuitive) subgroup. The purpose of this procedure was to ascertain what differences in anxiety level existed between the high objectivity and low objectivity subjects within each group. The Median Test, a nonparametric procedure involving chi-square techniques (7, pp. 125-126) was utilized to test for the significance of the differences between the anxiety medians in the high and low objectivity subgroups within the experimental and the control groups. The difference within the experimental group as tested by Fisher's (2, p. 69) exact method for testing  $2 \times 2$  tables is significant at the .004 level. However, the difference within the control group is not significant. These results would seem to support the hypothesis proposed at the outset of the study.

A surprising aspect of the results obtained by means of the Median Test is that the intuitively oriented subjects manifest a higher level of anxiety than those subjects who are objectively oriented. One can speculate that those who regard the methodology of psychology as capable of giving well-defined objective answers to problems are more likely to find security value in their work; and as a result perhaps they are *generally* less anxious than those who feel that only vague answers can be found through psychological methodology. Perhaps the more objectively oriented manifest less

anxiety than those intuitively oriented because of the greater reassurance they get out of their work. Or perhaps they are people who have less basic anxiety and who habitually find ways of attacking all problems in a manner designed to lead to tension-reducing objective answers. One may take the position that the greater anxiety level of intuitively oriented people represents pathology. But it makes better sense, perhaps, to regard it as an uncomfortable dissatisfaction with existing ways of defining the world; that is, anxiety might drive the individual to abandon already existing modes of interpreting phenomena and to seek new, more satisfying frames of reference.

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# THE TRAINING OF TECHNICAL WORKERS IN PSYCHOLOGY AT THE SUBDOCTORAL LEVEL

## A REPORT OF THE COMMITTEE ON SUBDOCTORAL EDUCATION OF THE EDUCATION AND TRAINING BOARD

ONE of the most difficult problems faced by the E & T Board during recent years has been that of the training of psychological workers at the subdoctoral level. Attitudes toward this level of training have ranged from outright denial of the desirability of having any psychologists with training less than the doctorate to the strong belief that the large bulk of psychological work has been and will continue to be done by those with only a one-year master's degree in psychology. Studies have shown that there are many types of positions requiring less than doctoral training (1), many persons legitimately affiliated with psychology as a profession who do not possess the doctorate (2, 3), and many institutions providing only subdoctoral level training programs (4, 6). In fact, Moore, on the basis of a 1953 survey, found that while "the number of students admitted to graduate study in departments with doctoral programs has been declining . . . the number admitted to institutions with subdoctoral programs in psychology has increased about 12 per cent during the past year" (5). The APA Committee on Training Below the Doctoral Level under George Speer in 1949 and the E & T Board Committees on Subdoctoral Education more recently (under the chairmanship of David McClelland in 1952, Ralph Berdie in 1953, and Louis Long in 1954) have stated the issues, stimulated grass-roots discussions at regional and national meetings, and considered the various viewpoints. An unpublished report of the 1954 Committee gathered together in detail the pro's and con's of the basic issues.

The 1955 Committee on Subdoctoral Education has considered the many statements and reports previously made, has engaged in discussions both as a committee and as individuals, and believes that the time has come to state as concisely as possible the committee's best collective judgment on certain basic issues. This is being done in order to provide a set of concrete recommendations for

consideration by the American Psychological Association. It is proposed that the policies concerning training be recommended to universities as a guide in their development of professional training programs in psychology. It is recognized, of course, that the policies concerning professional titles would not be applied retroactively to persons already established as members of the profession.

A. Professional training in psychology at the subdoctoral level<sup>1</sup> is desirable for the following reasons:

There is a social need for psychological workers at this level, as evidenced by the large proportion of those identified as psychologists, either through membership in psychological organizations or through employment in positions described as primarily psychological in nature, who do not possess the doctorate.

The number of doctoral psychologists available now and in the foreseeable future is insufficient to fill all the positions of a psychological nature which society has already established.

There will always be a large number of psychological positions which, although socially useful, are not sufficiently complex or challenging as to be appropriate career goals for doctorally trained psychologists. If psychology as a profession does not assume the responsibility for (and thereby have control over) the training of personnel for these positions, other less qualified professions will do so.

B. Appropriate distinctions as to role and title should be made between the subdoctorally trained psychological worker and the doctorally trained psychologist.

<sup>1</sup> This report deals only with subdoctoral training of a "terminal" nature, i.e., which is sufficient in itself for certain specified vocational goals. It is *not* concerned with "predoctoral" training, i.e., with the first stages in graduate training of those heading toward the doctorate. It is expected, however, that the two will not differ so greatly as to prevent student transfer from one to the other without undue loss of time or credit.

In contrast to the doctoral psychologist, whose training is designed to develop a professional worker able to take on broad responsibilities at a high level, the role of the subdoctorally trained person should be that of performing a limited group of psychological functions for which he has had specialized training.

Ideally, the subdoctorally trained person should work under the supervision of a doctoral psychologist. At present, however, it is not practical to specify such a requirement because of (a) the lack of doctoral psychologists in many work settings and (b) the fact there are some positions in which it is unlikely that supervision by doctoral psychologists is possible. It is imperative, therefore, to insure that the training program develops appropriate skills to an adequate level and that the individual be made aware of his professional limitations and ethical responsibilities.

At present, owing to the lack of both legal and professional certification in most states, the term "psychologist" is used by persons with varying amounts of training in psychology. In addition, the designations of fields of specialization within psychology are varied and loosely used. Provision of a system which would standardize terminology but which would still provide for future developments in psychology would be desirable at this time.

*Recommendation No. 1. It is therefore recommended that:*

*The generic term "psychologist" be used to characterize an individual trained at the doctoral level and the generic term "psychological technician" the individual trained at the subdoctoral level.*

At the doctoral level, the field of specialization can be designated by the addition of appropriate adjectives, such as Clinical Psychologist, Counseling Psychologist, Industrial Psychologist, School Psychologist, Research Psychologist, etc. At the subdoctoral level, the term "Psychological Technician" will be of value as a general designation for licensing or certification purposes; at this level, job titles descriptive of the field of specialization can be formed by using the adjective "psychological" in conjunction with appropriate nouns, such as Psychological Counselor, Psychological Examiner, Psychological Research Assistant, etc.

*Recommendation No. 2. It is therefore recommended that:*

*Descriptions of the professional functions which psychological technicians in the various specialties are qualified to perform should be prepared by APA and made available to training institutions and potential employers.*

These descriptions should differentiate clearly between those functions appropriate to psychological technicians and those restricted to psychologists and should indicate the type and amount of supervision required by psychological technicians in the performance of these functions.

C. As in the selection of candidates for doctoral level training, selection for subdoctoral training programs should be based upon a variety of personal attributes relating to both academic success and personal and professional relationships. Since little objective information is currently available on predictors of success in psychology, this committee has no specific recommendations concerning selection procedures for subdoctoral training programs. It is possible that less emphasis need be placed on high-level academic ability per se, and upon long-term career goals; on the other hand, the psychological technician as well as the psychologist must have sound professional attitudes, a basic concern for human welfare, and interest in service activities. He should bring to his graduate training and work a broad background of knowledge of human behavior and of society, rather than narrow, specialized interests.

*Recommendations Nos. 3, 4, 5. The Committee therefore recommends that the American Psychological Association:*

*Encourage colleges and universities to emphasize, in the selection of students for admission for graduate training in psychology, a broad undergraduate education as well as basic work in psychology;*

*Discourage the teaching, at the undergraduate level, of specialized techniques courses designed to develop professional skills in the appraisal and treatment of the individual; and*

*Encourage a full scale study of the over-all problems of recruitment and selection of graduate students in psychology.*

D. Adequate training for psychological technicians cannot properly be given in one year of graduate training.

It is highly desirable that psychological technicians identify with psychology as a profession and

be able to meet membership requirements in psychological associations. Thus the training program must include a basic grounding in psychology as a science.

Since psychological technicians should be proficient in a specified set of psychological functions related to the field of specialization, provision in the training program must be made for training and supervised practice in those functions.

*Recommendation No. 6. The Committee therefore recommends that:*

*Training programs for psychological technicians provide four semesters (or six quarters) of graduate training and include the following:*

*A core curriculum designed to insure knowledge in the basic areas of psychology as a science, such as:*

- Scientific method and psychological research
- Historical trends in psychology
- Statistics, sufficient to enable the student to read and evaluate relevant research
- Normal and abnormal modes of adjustment
- Personality organization
- Individual differences and their measurement
- Developmental psychology

*Techniques courses in the field of specialization, including laboratory practice;*

*Supervised practice in appropriate work settings.*

Approximately half of the total program should be in the core curriculum with the techniques courses and supervised practice making up the other half. The practicum training will vary with the field of specialization but certainly should comprise no less than, and preferably more than, a fourth of the second year's work. Provision should be made both in course work and practicum for developing an understanding of professional ethics and of the social and work setting in which the individual will be operating. A research thesis and competence in foreign languages need not be required. Definite provision should be made, however, for insuring ability to evaluate research literature, for developing critical attitudes toward one's own performance, and for stimulating awareness of research needs in the operating situation. A comprehensive examination covering both the basic training in psychology and in the field of specialization should be given at the conclusion of the training program. Close liaison should be main-

tained between the training institution and the practicum facilities to insure that the practicum training experiences are adequate and that an accurate evaluation of the trainee's competencies is possible.

E. Since in many institutions a master's degree is currently obtainable after one year of graduate work, the issue arises as to whether or not this degree should be associated with the two-year subdoctoral program recommended above.

This committee considers it desirable to continue using the master's degree as a designation for training below the doctoral level since the degree occupies a strong traditional position in the educational hierarchy.

The master's degree in psychology, however, should represent professional competence at the technician level described above. The one-year master's degree of the academic or cultural type, therefore, should no longer be granted in psychology.

*Recommendation No. 7. The Committee therefore recommends that:*

*The master's degree be continued as a subdoctoral degree but be granted only upon completion of a training program of the type recommended above.*

The primary reason for this recommendation is the elimination of the current ambiguity of the master's degree. At present, the master's programs in psychology are of at least three types: (a) those of a general theoretical nature, designed primarily for students planning to continue work toward the doctorate; (b) those similar to a but including some professional training for the student who terminates his graduate work at the master's degree level; and (c) those oriented primarily toward terminal professional training of various types. The degree therefore has no common denotative value. The proposed plan would put an end to both the one-year technical degree and the use of the master's degree as a "consolation prize" for failure to get the doctorate.

With the master's degree clearly professional in nature, the public interest would be served in that the degree would represent a designated level of competence. The interest of the profession would also be served in that the nondoctoral student would be motivated to obtain an adequate amount of training. Since employers customarily do not differentiate between different types of master's



degrees, there is danger that graduates of the one-year program will attempt to fill positions for which they are inadequately trained to the detriment of both the employers and the profession.

F. Recognition should be granted to those subdoctoral training programs meeting the standards described above. The American Psychological Association is the appropriate body to provide such recognition through official approval, based on a careful evaluation, for the following reasons:

The master's degree in psychology, under the proposed program, would become a professional degree and the profession has the responsibility to the public for insuring that its workers meet professional standards.

Such an accreditation or approval program is necessary to insure minimum standards of training and to facilitate this needed step in the professionalization of psychology.

Although the task would be a heavy one, since there are now over 125 institutions giving subdoctoral training in psychology, the American Psychological Association is the organization on whom the responsibility properly rests. The regional and state associations, however, could be asked to perform most of the required field work, and the accreditation program, once established, could be maintained without undue burden and expense.

*Recommendation No. 8. The Committee therefore recommends that:*

*The Education and Training Board study possible ways of setting up accreditation procedures for subdoctoral training programs.*

#### IMPLICATIONS AND EXPECTED OUTCOMES OF THE RECOMMENDATIONS

Psychology is a rapidly growing profession and has an obligation to protect the public which seeks its services. The setting of training standards, differentiation between two levels of professional training, and designation of these levels by appropriate professional titles represent an attempt to meet this obligation.

The Committee on Subdoctoral Education was concerned with this objective and also with the effect that the recommendations would have upon the present and future status of psychology. The recommendations have far-reaching implications and outcomes in many facets of professional growth.

The following are those which the Committee considers of particular importance:

1. Each psychology department now offering advanced degrees should consider carefully its staff and facilities with the following alternatives in mind:

a. Discontinue offering the PhD degree and concentrate on giving a master's degree of the nature outlined in the above recommendations.

b. Discontinue offering the master's degree in order to strengthen the doctoral program, if the latter is found to suffer because of the time and energy required for the former.

c. Discontinue some areas of specialization in which master's and doctor's degrees are currently offered.

d. Concentrate on offering only the core curriculum year of graduate training, with the students completing the subdoctoral or doctoral work at another institution.

In general, each department should develop a clear rationale for the particular role it plans to take in training psychologists and should insure that its staff and facilities are appropriate for its chosen objectives.

2. The introduction of the two-year professional master's degree and the elimination of the one-year master's degree would serve to raise the level of psychological service to the public and to clarify the meaning of the degree as a designation of professional competence.

3. The proposed program would provide specifications for legal and intraprofessional certification of psychological technicians.

4. Graduates of the proposed two-year program would clearly meet present membership requirements in APA. The recommended program would also permit raising membership requirements without "disenfranchising" a large group whose presence in APA is desirable.

5. The recommended program would tend to encourage the training of psychological technicians by psychologists rather than by other professional groups and would discourage training in psychological diagnosis and counseling without the basic grounding in psychology represented by the core curriculum.

6. The program would provide many psychology departments with a concrete, meaningful, and socially valuable goal upon which to organize its curriculum.

## CURRENT STATUS AND NEXT STEPS

The above statement of recommendations and implications represents the current thinking of the Committee on Subdoctoral Education based upon a report presented to the Education and Training Board and discussed at the Board meeting on April 3, 1955, and reconsidered by this Committee at its May 21-22, 1955, meeting. The E & T Board approved Recommendations Nos. 1, 2, 3, 4, and 6 with certain modifications, which have been incorporated into the present statement, and transmitted them to the APA Board of Directors.

Recommendation No. 5, dealing with the need for a full-scale study of problems of recruitment and selection of graduate students in psychology, was implemented by the E & T Board's decision to create an *ad hoc* committee consisting of the chairmen of three standing E & T Board committees, namely the Committees on Undergraduate Education, Subdoctoral Education, and Doctoral Education, to prepare a proposal for such a study.

Recommendation No. 8, suggesting a study of accreditation procedures for subdoctoral training programs, was referred back to the Committee on Subdoctoral Education for further consideration of the philosophy, practicability, and appropriateness of such accreditation.

Recommendation No. 7, dealing with the elimination of the one-year master's program in psychology, was not included in the E & T Board's report to the APA Board of Directors. The Committee on Subdoctoral Education has given renewed consideration to this recommendation and has incorporated into the present statement a more detailed rationale underlying its continued belief in the advisability of this step.

At the May 13, 1955, meeting of the APA Board of Directors, the recommendations approved by the E & T Board were discussed. Aware of the crucial significance and implications of the proposals, the Directors recommended that there be widespread discussion of the issues before official APA policy is established. The Board of Directors, therefore,

authorized the publication of the Committee report in its entirety in order to bring the issues to the attention of the members of the profession and to facilitate discussion.

The Committee on Subdoctoral Education herewith presents its report to the general membership of APA. To stimulate careful and complete consideration of the pro's and con's of what it considers an important and desirable step in the development of psychology, the Committee is planning to initiate discussions at regional and state associations and to obtain the views of departments offering graduate training. It also invites expression of opinion from individual psychologists. Such communications may be addressed to Dr. Albert S. Thompson, Department of Guidance, Teachers College, Columbia University, New York 27, New York.

Respectfully submitted,

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# PROCEEDINGS OF THE FORTY-SEVENTH ANNUAL MEETING OF THE SOUTHERN SOCIETY FOR PHILOSOPHY AND PSYCHOLOGY

JOSEPH E. MOORE, *Secretary*  
*Georgia Institute of Technology*

ONE HUNDRED and forty members registered for the Forty-seventh Annual Meeting of The Southern Society for Philosophy and Psychology, held in New Orleans April 7-9, 1955. Tulane University was the host institution.

The Society elected the following psychologists to full membership: Louis Acuff, James C. Crumbaugh, Jack D. Holbrook, Charles O. Hopkins, John A. Hornaday, Howard Ihrig, Antonia B. Morgan, Robert Reiff, Kendon R. Smith, Saul B. Sells, George R. Soika, Theodor D. Sterling, William A. Wilbanks, and Gerald H. Whitlock. The following psychologists were elected associate members: William B. Bierbaum, John A. Creelman, Junius A. Davis, Elizabeth H. Faulk, Will A. Justiss, Harry S. Upshaw, and Sanford R. Wilson.

The annual banquet was held at Tulane University. Karl Dallenbach acted as Toastmaster. The presidential address, delivered by Charles A. Baylis of Duke University, was entitled "Our Knowledge of Values."

Saturday, April 9th, the Society assembled in joint session to hear a panel discussion on "Segre-

gation in Southern Colleges and Universities." The participants were: Charles I. Silin, Chairman, Tulane University; Daniel C. Thompson, Dillard University and The Urban Life Research Center; John Rohrer, Tulane University and The Urban Life Research Center; Carl H. Hamburg, Tulane University; and M. L. Harvey, Southern University.

The new officers elected were: President, Marion E. Bunch, Washington University; Secretary, Joseph E. Moore, Georgia Tech; Treasurer, Sam C. Webb, Emory University; Council members, Arthur L. Irion, Tulane University, and William Weedon, University of Virginia.

The 1956 meeting will be held at Asheville, North Carolina.

The Society unanimously recorded its gratitude to the Departments of Philosophy and Psychology of Tulane University, to the Dean of the Graduate School, to the Jung Hotel, and to the New Orleans Convention Bureau. The meeting adjourned at 11:50 A.M.

## PROGRAM<sup>1</sup>

### Section A: General I

CECIL W. MANN, Chairman

A study of factors associated with absenteeism among students in a metropolitan high school located in an economically advantaged school community. JAMES E. GREEN AND R. TRAVIS OSBORNE, *University of Georgia*.

Criterion development for accident proneness research. GERALD H. WHITLOCK, *Carbide and Carbon Chemicals Company*.

Research in selection for motivation in Navy pilot training. ALAN D. GRINSTED, *Naval Air Training Command*.

The relation of physical fitness measures to criteria of training performance. JOHN ASHMORE CREELMAN, *Naval Air Training Command*.

<sup>1</sup> Psychology Section only.

Correlates of sociometric status among peers. JUNIUS A. DAVIS, *Emory University*.

A study of the value of the Flesch reading ease formula in preparing material to be read by first-line supervisors. LOUIS ACUFF, *Mississippi State College*.

The effect of social facilitation on food intake in puppies fed separately and together for the first 90 days of life. W. T. JAMES AND T. F. GILBERT, *University of Georgia*.

Confirmation of theories in psychology. F. J. MCGUIGAN, *Human Research Unit No. 1*.

### Section B: Clinical

HERDIS L. DEABLER, Chairman

A comparative study of college disciplinary offenders and non-offenders by use of the MMPI. R. TRAVIS OSBORNE, WILMA B. SANDERS, AND FLORENCE M. YOUNG, *University of Georgia*.



An investigation of the effects of group psychotherapy on chronic schizophrenic patients.

DOUGLAS A. R. PEYMAN, *University of Alabama*.

Distribution curves of the Rorschach factors.

IRVING ARTHUR FOSBERG, *VA Hospital, New Orleans, La.*

Perceived parental attitudes, the self, and security.

SIDNEY M. JOURARD, *Emory University*.

The Harrower-Erickson Multiple Choice Test and the Machover Test as complementary technics in "pin-pointing" adjustment difficulties of student affiliates in a school of psychiatric nursing. MARION MCKENZIE FONT, *De Paul Hospital and Ochsner Clinic*.

### Section C: Learning I

WILSE B. WEBB, Chairman

Human compound trial-and-error learning as a function of locus of reward and type of pacing. CLYDE E. NOBLE, *Louisiana State University*.

Human mixed selective learning under variant and invariant sequences. C. E. NOBLE AND F. J. FARESE, *Louisiana State University*.

Rate of paired associate learning and amount of reminiscence. THEODOR D. STERLING, *University of Alabama*.

Probability learning in a multiple-choice situation. MILTON A. GRODSKY AND OSCAR S. ADAMS, *Emory University*.

Familiarity and recognition of nonsense shapes. MALCOLM D. ARNOULT, *Skill Components Research Laboratory, AFPTRC*.

### Section D: General II

THOMAS RICHARDS, Chairman

Alternative factorial solutions. EDWARD E. CURETON, *University of Tennessee*.

Patterns of experience and an indifference point for lifted weights. WILLIAM BEVAN AND CHARLES DARBY, *Emory University*.

Audiogenic seizures in rats castrated and placed on androgen therapy. RALPH MCC. CHINN AND WILLIAM BEVAN, *Emory University*.

Personalities in faces: II. Individual differences in the perception of women's faces. PAUL F. SECORD AND JOHN E. MUTHARD, *Emory University*.

Employee morale: The relationship between sharing group goals and expressed job satisfaction. GERALD H. WHITLOCK, *Carbide and Carbon Chemicals Company*.

Reliability of ratings obtained from an unstructured evaluation sheet. RICHARD A. GOODLING, IRMA

L. SHEPHERD, AND SAM C. WEBB, *Emory University*.

Cooperation between rats in pairs and trios. LOH-SENG TSAI, *Tulane University*.

Effect of temperature upon school achievement. GEORGE DOUGLAS MAYO, *Naval Air Technical Training Command*.

### Section E: Perception

IRVING A. FOSBERG, Chairman

A psychophysical study of the complexity of shapes.

FRED ATTNEAVE, *Skill Components Research Laboratory, AFPTRC*.

The landmark characteristics of a pair of points.

CLINT D. ANDERSON AND FRED ATTNEAVE, *Skill Components Research Laboratory, AFPTRC*.

Spatial distribution of gustatory sensitivity with age. KARL M. DALLENBACH, *University of Texas*.

The relationships between measures of cortical Alpha activity and measures of apparent motion.

S. R. WILSON AND E. PORTER HORNE, *University of Florida*.

Pre- and poststimulus setting cues in the perception of ambiguous visual stimuli. RICHARD H. HENNEMAN, *University of Virginia*.

A new three dimensional space perception test. J. STANLEY GRAY, *University of Georgia*.

### Section F: Learning II

ABRAM AMSEL, Chairman

The effect of various levels of reactive inhibition on speed of learning under massed and distributed practice. LEONARD MORGAN, *University of Kentucky*.

An empirical study of the bilateral transfer of work decrement effects as a function of length of rest. HOWARD BELL, *Louisiana State University*.

Discrimination of concentric ring patterns by monkeys. A. J. RIOPELLE, J. M. BANSAVAGE AND R. L. WUNDERLICH, *Emory University*.

An experimental study of the effectiveness of spontaneous alternation in facilitating learning. RUSSELL F. TOMLINSON, JR. AND ROLLAND H. WATERS, *University of Florida*.

Memory as affected by activity of the relevant receptor. ROBERT THOMPSON AND J. HOWARD BRYANT, *Louisiana State University*.

The interdependency of cyclical eating and drinking behaviors and their dependency upon light. THOMAS F. GILBERT AND W. T. JAMES, *University of Georgia*.

# PROCEEDINGS OF THE TWENTY-SEVENTH ANNUAL MEETING OF THE MIDWESTERN PSYCHOLOGICAL ASSOCIATION

LEE J. CRONBACH, *Secretary-Treasurer*  
*University of Illinois*

THE Midwestern Psychological Association held its twenty-seventh annual meeting at the Hotel Sherman, Chicago, Illinois, on April 28-30, 1955, with 1,363 persons registered. The program consisted of 131 papers, including sessions on the customary topics of learning, personality, sensation, and testing. Sufficient papers were received to warrant separate sessions on human engineering, experimental studies of anxiety, probability, learning, and problem solving. Symposia were presented on the following topics: Mutuality and Reorientation, The Expanding Responsibilities of School Psychology, Psychological Principles and Techniques Used in Advertising Research, The Iowa Picture Interpretation Test, and Effects of the Small Group on Personality Functioning.

The presidential address, "Wanted—a Good Cookbook," was delivered by Paul E. Meehl of the University of Minnesota. The address was followed by a social hour.

The Program Committee consisted of Benton J. Underwood, Chairman, Ivan N. Mensh, C. H. Lawshe, and Lee J. Cronbach. Local arrangements were under George S. Speer, who was assisted by John W. Cotton, Joe Kamiya, A. Leonard Diamond, Donald J. Lewis, William C. Krathwohl, Austin D.

Riesen, and Charlotte Ellis. Carl Rush, Jr., and Michael Amrine of the APA Central Office assisted with placement and public information, respectively. Benton J. Underwood was elected President, Donald W. Fiske was elected Secretary-Treasurer for a three-year term, and W. K. Estes and George S. Speer were elected to the Executive Council. The continuing member of the Council is Julian B. Rotter.

The following persons were elected to life membership: John E. Anderson, M. Grace Arthur, Charles Bird, Vida D. Davison, W. H. Gray, Edmond Jacobson, Theodore F. Lentz, Leslie R. Marston, Norman C. Meier, Virginia L. Nelson, H. B. Reed, Thelma G. Thurstone, and Paul T. Young. The business meeting accepted a total of 284 new members, bringing the total membership to 1,666.

According to the standing practice of the Association, any APA member may automatically become a member of MPA by submitting his dues payment (\$1.25 for one year; \$3.00 for three years) to the Secretary-Treasurer (D. W. Fiske, University of Chicago); persons joining under this provision prior to the 1956 program deadline may submit papers.

The following 231 APA members became MPA members during the year ending April 1:

George W. Albee  
Helen Joan Anderson  
Stephen K. Atwater  
Donald E. Baier  
Harold Bamford  
John Barlow  
Robert Barrell  
Richard Barrett  
William F. Bennett  
Robert Bilger  
Arnold Binder  
David Blyth  
Ottmar Bodemer  
Stanley F. Bolin

Sister Mary J. Bosco  
Homer Bradshaw  
Raymond M. Bragiel  
Joseph Brewer  
Leslie Briggs  
Peter F. Briggs  
Gerald S. Briskin  
Kenneth Brown  
John Brownfain  
Jan H. Bruell  
John E. Bryant  
John Canney  
R. Capobianco  
Robert Carlton

Jim Carruth  
Joe T. Carter  
Alfred Castaneda  
John Caylor  
Armand Chambers  
Julien Christensen  
Richard R. Clampitt  
Walter A. Clevin  
Edward Clifford  
William Colley  
John J. Conger  
Edmund Conklin  
William E. Cook  
Rue L. Cromwell

Samuel Cummings  
S. Thomas Cummings  
Charles L. Darby  
Henry P. David  
Howard Davis  
Herbert Dawson  
John Demming  
Marvin H. Detambel  
Harold Dial  
Andrew Dibner  
Raleigh Drake  
Ralph Dunlap  
Wesley Dunn  
Ann Durkee

Lawrence Edmonson  
Ward Edwards  
Thomas Ewing  
Edmund Faison  
Robert Fitzpatrick  
Herbert Fleischer  
Edwige Florence  
William J. Flynn, Jr.  
Alvin Galitzin  
Richard Gaylord  
J. R. Gentry  
W. A. Gibson  
John C. Glidewell  
William Goff  
Israel Goldiamond  
Eugene S. Gollin  
Donald Grant  
John O. Grimmett  
Glen Grimsley  
Byron Groesbeck  
Martin Grossack  
C. G. Hackett  
Adolf J. Hafner  
Andrew Halpin  
Edgar M. Haverland  
Charles Heineman  
Mary Heyman  
William Heyman  
Lois Hilgeman  
Shirley Holt  
Paul Hood  
Marion E. Hook  
Angela Homme  
Stanley Horowitz  
Monte F. Housholder  
Phyllis Huffman  
Marvin Hyman  
Walter Isaac  
Harry Jerison  
George H. Johnson  
Laverne C. Johnson  
Robert E. Jones  
James F. Kamman  
Bert Kaplan  
Harry W. Karn  
Arnold Katz  
Melvin Kaufman  
Henry E. Klugh III  
Felix Kopstein  
Sheldon J. Korchin  
Robert Krug  
Donald Kuhn  
James K. Lang  
Margaret Lang  
Ruth L. Latin  
Irving Lazar  
Leonard Learner  
Dell Lebo  
Marilyn Lee  
Richard H. Lee

Russell Leiter  
Billy Levinson  
Seymour Levy  
Edward Lewis  
Kenneth E. Lloyd  
Jane Loevinger  
Herbert K. Lotz  
Richard M. Lundy  
Zella Luria  
Howard B. Lyman  
David B. Lynn  
Joseph Lyons  
Milton W. McCullough  
James McGuire  
Arthur C. MacKinney, Jr.  
Howard Maher  
Herbert Malos  
Billie Sue Mandl  
David Markenson  
Anthony Martin  
Frank Martin, Jr.  
Ruth G. Matarazzo  
Howard Moltz  
Jack J. Monroe  
Edward J. Morrison  
Dorothy Mundy  
Harvey Nash  
James Neeland  
Richard Newton  
Harry E. O'Neill, Jr.  
Samuel Ornstein  
Charles E. Osgood  
Leon S. Otis  
Jack A. Parrish  
Mervin Patterson  
Ruth Patterson  
Helen Peak  
Charles Perin  
Jack Peterman  
William M. Peterson  
Francis J. Pilgrim  
Robert Pitcher  
Charles R. Porter  
Vonne F. Porter  
Thomas A. Powers  
Gordon D. Pred  
Robert Rankin  
W. W. Renke  
Henry W. Riecken  
Thomas A. Ringness  
Ira Robinson  
Raymond A. Roesch  
A. R. Root  
Milton Rosenbaum  
Robert Rosenthal  
Thomas Rowan  
Stanley Rubin  
Henry Samuels  
Bernard Saper  
Thelma Schoonover

Erna Schwerin  
Robert W. Scollay  
Catherine Semans  
Alden B. Sears  
Rita Senf  
Lewis J. Sherman  
Reuben Shevitz  
Franklin Shontz  
Raymond Sidorsky  
Alvin L. Simberg  
Persis Simmons  
J. Richard Simon  
Walter Simon  
Arthur Singer, Jr.  
Robert Sinnett  
Meade E. Smith  
Zanwil Sperber  
Bernard Spilka  
Harold Sprinzen  
Hazel Stevens  
George Suci  
Alan D. Swain  
Robert Tallarico  
Harvey Thomas  
Leland Thune  
John R. Tilton  
Lawrence Tober

John Townsend  
William C. Trow  
V. M. Tye  
William Vandament  
Donald W. Van Liere  
Sidney Varian  
William B. Walker  
Verne Walter  
Hensel Ward  
Willard Warrington  
Dale S. Weber  
Max M. Weinlander  
Charles Wenar  
Francis J. Werner  
Morton Wiener  
Richard Wienke  
Hardyd C. Wilcoxon  
John E. Williams  
Marjorie Williamson  
Ben James Winer  
William Winter  
Robert D. Wirt  
Fred Wright  
J. Jepson Wulff  
Harold E. Younkman  
Linn Zook  
Marvin Zuckerman

The following 53 applicants were elected to membership:

Lewis Albright  
Nancy S. Anderson  
Leslie Beach  
Paul J. Blood  
Robert A. Bolda  
Lyle E. Bourne, Jr.  
Ralph Cochran, Jr.  
Lark Daniel  
William A. Deterline  
Larry Doty  
Jean Engler  
Myron A. Fischl  
Lyman M. Forbes  
Lawrence Fox  
Judith Frankmann  
Alan Fredian  
Edward Hackett  
Carolyn J. Hall  
Robert W. Heath  
John S. Hickman  
Edward L. Holshouser  
Terry W. Hudson  
Kay Inaba  
John I. Johnson, Jr.  
Marcha L. Johnson  
Robert Jordan  
Robert D. Kelly

Donald King  
Chris Koronakos  
Martin Lakin  
Alfred Leonard  
R. Daniel Malone  
Harold Mandl  
Samuel Miller  
Louis E. Moon, Jr.  
Lionel W. Mosing  
Robert Myers  
Haig K. Naylor  
David S. Palermo  
Ambalal S. Patel  
Robert G. Pfefferkorn  
Paul H. B. Poschel  
Erich P. Prien  
William Prokasy, Jr.  
Walter J. Raine  
William Rambo  
Robert R. Rueping  
Gordon Sedlacek  
Walter D. Storey  
Richard Thackray  
William Ward  
Frederic L. Ware  
Richard Willis



## PROGRAM

Abstracts of papers have been deposited with the ADI Auxiliary Publications Project, Photoduplication Service, Library of Congress, Washington 25, D. C., as Documents No. 4568-4586. When ordering, remit the price listed below for 35 mm. microfilm, or photoprints, using check or money order payable to: Chief, Photoduplication Service, Library of Congress. Advance payment is required.

Title	ADI No.	Microfilm	Photoprint
Test Construction	4568	\$2.00	\$3.75
Human Engineering	4569	\$2.00	\$3.75
Physiological Studies	4570	\$1.75	\$2.50
Group Structure	4571	\$2.00	\$3.75
Sensation	4572	\$1.75	\$2.50
Verbal Learning	4573	\$1.75	\$2.50
Perception	4574	\$1.75	\$2.50
Clinical Populations	4575	\$2.00	\$3.75
Animal Learning	4576	\$2.00	\$3.75
Discrimination Learning in Animals	4577	\$1.75	\$2.50
Probability Learning	4578	\$2.25	\$5.00
Problem Solving	4579	\$1.75	\$2.50
Validity of Clinical Assessments	4580	\$2.00	\$3.75
Perceptual Learning	4581	\$1.75	\$2.50
Educational Practices	4582	\$1.75	\$2.50
Predictive Validity of Personnel Tests	4583	\$1.75	\$2.50
Comparative	4584	\$1.25	\$1.25
Experimental Studies of Anxiety	4585	\$2.00	\$3.75
Personality	4586	\$1.75	\$2.50

## SYMPOSIA

## Mutuality and Reorientation

FRANKLIN J. SHAW, *Purdue University*, Chairman

Mutuality and reorientation as a function of up-ended expectancies. FRANKLIN J. SHAW, *Purdue University*.

The concept of mutuality as related to socialization.

JOHN ROHRER, *Tulane University*.

The therapist as strategist. MAX HUTT, *University of Michigan*.

The concept of the organism as a manufacturer of theories. DAVID LYNN, *Indiana University Medical Center*.

## The Expanding Responsibilities of School Psychology

FRANCES A. MULLEN, *Chicago Public Schools*,  
Chairman

Why is school psychology important today? FRANCES A. MULLEN, *Chicago Public Schools*.

Expanding duties of the school psychologist. DALE HARRIS, *University of Minnesota*.

How do we distinguish a school psychologist from other professional workers? SUSAN GRAY, *Peabody College for Teachers*.

Expanding training facilities for school psychologists. NOBLE KELLEY, *Southern Illinois University*.

Certification of school psychologists. T. ERNEST NEWLAND, *University of Illinois*.

## Psychological Principles and Techniques Used in Advertising Research

ALFRED R. ROOT, *Knox-Reeves Advertising, Inc.*,  
Chairman

The use of statistical techniques in advertising research. DIK W. TWEDT, *Needham, Louis and Brorby, Inc.*

The use of projective tests and clinical methods in advertising research. DONALD L. KANTER, *Gould, Gleiss and Benn, Inc.*

The use of psychological apparatus in advertising research. EDMUND W. FAISON, *Needham, Louis and Brorby, Inc.*

The use of semantic differential in advertising research. PERCY H. TANNENBAUM, *University of Illinois*.

The use of principles of learning in advertising. STEUART HENDERSON BRITT, *Needham, Louis and Brorby, Inc.*

The relation of academic psychologists to advertising research. JAMES J. JENKINS, *University of Minnesota*.

## The Iowa Picture Interpretation Test (IPIT)

I. E. FARBER, *State University of Iowa*, Chairman

Verbal learning as a function of instruction and IPIT scores. JOHN R. HURLEY, *Michigan State College*.

The role of verbal incentives and IPIT scores in two kinds of maze learning. LEONARD D. GOODSTEIN, *State University of Iowa*.

The interaction between IPIT scores and task complexity. SHIRLEY KLUMB, *Northwestern University*.

A methodological analysis of a revised form of the IPIT. ROBERT A. JOHNSTON, *State University of Iowa*.

Discussants: JACK C. GILCHRIST, *University of Wisconsin*, AND JOHN W. ATKINSON, *University of Michigan*.

#### Effects of the Small Group on Personality Functioning

ROSS STAGNER, *University of Illinois*, Chairman

Family interaction and achievement values. FRED L. STRODTBECK, *University of Chicago*.

Group standards and management of hostility. MURRAY HORWITZ, *University of Illinois*.

Group processes and individual psychotherapy. SHELDON J. KORCHIN, *Michael Reese Hospital*.

Discussants: HENRY W. RIECKEN, *University of Minnesota*; ROSS STAGNER, *University of Illinois*.

### PROGRAMS

#### Test Construction

JANE LOEVINGER, *Washington University*,  
Chairman

WILLIAM A. DETERLINE, *University of Pittsburgh*.  
The dependency factor in rating tasks.

LYLE V. JONES, *University of Chicago*. Some factors affecting efficiency of rating scales.

JACK C. MERWIN AND LEO J. CRONBACH, *University of Illinois*. A model for predicting the validity of multiple-choice items.

JOHN W. COTTON, *Northwestern University*. The relationship between factorial composition of test items and of the total test.

EDGAR M. HAVERLAND, *Indiana University, Kokomo Center*. An analytical solution for proportional profiles factor rotation.

CHARLES WRIGLEY AND DONALD W. STILSON, *University of Illinois*. Voting behavior in the United Nations.

#### Human Engineering

DON LEWIS, *University of Iowa*, AND ALEXANDER WILLIAMS, *University of Illinois*, Chairmen

SHELBY J. HARRIS, *University of Wisconsin*, AND JOSEF BROZEK, *University of Minnesota*. The effects of a 24-day subsistence diet on the travel and manipulation components of motion.

LYLE E. BOURNE, JR., *University of Wisconsin*. Time continuously on target as a function of distribution of practice.

JOHN I. JOHNSON, JR., AND KENNETH M. MICHELS, *Purdue University*. The effect of handedness on mirror-tracing and its measurement.

WILLIAM F. BATTIG, *University of Wisconsin*. A study of acquisition of a finger-positioning skill.

JANET HUISKAMP AND ROBERT C. SMADER, *University of Wisconsin*. The effects of visual and blind conditions on the manipulative and travel components of human motion.

E. JAMES ARCHER AND GEORGE W. KENT, *University of Wisconsin*. Effect of long-term practice and time-on-target information feedback on a complex tracking task.

FREDERICK H. KRESSE, *University of Wisconsin*. Effect of rate of automatically-paced training in a multidimensional psychomotor task.

DONALD L. HECKER, DONOVAN R. GREENE, AND KARL U. SMITH, *University of Wisconsin*. High precision electronic motion analysis technique applied to a time-study problem.

STEWART J. BRIGGS AND JACK W. DUNLAP, *Purdue University*. A study in the design of work areas.

ELMER B. SIEBRECHT, *Iowa State College*. Distribution of certain traffic accident problems under several conditions.

#### Physiological Studies

L. I. O'KELLY, *University of Illinois*, Chairman

GILBERT M. FRENCH, *University of Wisconsin*. Habituated locomotion in normal and brain damaged rhesus monkeys.

RICHARD G. PEARSON AND ROBERT O. BAUER, *USAF School of Aviation Medicine*. The effects of opiate mixtures on psychomotor performance.

WALTER ISAAC AND THEODORE C. RUCH, *University of Washington School of Medicine*. The effects of whole body X irradiation upon the activity level of the rhesus macaques with an evaluation of four activity measurement techniques.

CYRIL C. O'BRIEN, *Marquette University*. Intensive calcium therapy as an initial approach to the psychotherapeutic relationship in the rehabilitation of the compulsive drinker.

### Group Structure

THORNTON ROBY, *AFPTRC, Randolph Air Force Base*, Chairman

SIDNEY ROSEN, *University of Michigan*. Three paths to upward mobility.

JOHN P. PAISIOS, *Science Research Associates*. Social distance and housing: an investigation of the attitudes of an industrial population.

ELIZABETH G. FRENCH, *AFPTRC, Lackland Air Force Base*. Some characteristics of affiliation motivation.

RANDALL M. CHAMBERS, *Jackson Memorial Laboratory*. The social organization of some science research apprentices in recreational, routine-work, and scientific activities.

SEYMOUR ROSENBERG, *Aircrew Research Field Unit*. Similarity of interest and attitude measures as a predictor of interpersonal relationships in a medium-bomber crew.

SOLIS L. KATES, *University of Oklahoma*, AND CHARLES H. MAHONE, *University of Michigan*. Effective group participation and subscription to group values.

E. P. HOLLANDER, *Carnegie Institute of Technology*. Leadership, attitude estimates and communicability.

GEORGE S. LEAVITT, GEORGE C. STONE, AND N. L. GAGE, *University of Illinois*. Accuracy of leaders in predicting intragroup preferences.

### Sensation

W. D. NEFF, *University of Chicago*, Chairman

I. J. HIRSCH, R. C. BILGER, AND B. H. DEATHERAGE, *Central Institute for the Deaf*. The apparent duration of sounds and lights.

A. LEONARD DIAMOND, *Northwestern University*. Apparent brightness of a field as a function of its duration.

PETER J. CHINETTI, JR., *University of Wisconsin*. The role of simultaneous contrast in brightness constancy.

LYMAN M. FORBES AND FREDERICK A. MOTE, *University of Wisconsin*. A comparison of the variability of monocular and binocular threshold

measurements during dark adaptation of the human eye.

JEROME COHEN, *Antioch College*. A psychophysical scale of apparent depth as a function of binocular disparity.

ROBERT S. SOAR, *Vanderbilt University*. Stroke-width, illumination level, and mode of figure-ground contrast in numeral visibility.

### Verbal Learning

SUMNER HAYWARD, *Carleton College*, Chairman

ELI SALTZ AND THOMAS I. MYERS, *Human Resources Research Unit No. 2, Fort Ord, California*. A method for group presentation of paired-associates learning materials.

IRVING J. SALTZMANN, *Indiana University*. Comparisons of incidental and intentional learning with different orienting tasks.

CLYDE E. NOBLE, *Louisiana State University*. The effect of familiarization upon serial verbal learning.

KENNETH E. LLOYD, *University of Virginia*. The retention of responses to specific verbal stimuli compared with the retention of responses to classes of verbal stimuli.

LLOYD R. PETERSON, *Indiana University, Gary Center*. Experimental establishment of a verbal-habit hierarchy.

GEORGE E. BRIGGS, *Northwestern University*. Retroactive inhibition as a function of amounts of original and interpolated learning.

MARY A. MORROW, *Bowling Green State University*. The relation of overt errors to retroactive inhibition.

### Perception

WILLIAM F. SOSKIN, *University of Chicago*, Chairman

GEORGE REX HURT, *Illinois Institute of Technology*. Dissipation of cortical after-effects following prolonged inspection of apparent movement.

H. LEIBOWITZ, *University of Wisconsin*. Time and intensity as determiners of perceived shape.

PAUL BAKAN AND JAMES ALLEN, *Michigan State College*. Effect of attention level on estimates on the duration of a listening task.

ARON W. SIEGMAN, *University of Wisconsin*. Some factors associated with visual threshold of taboo words.



CHARLES D. SPIELBERGER, *State University of Iowa*. The effects of stuttering behavior and response set on recognition thresholds.

JAMES T. FREEMAN, *Iowa State College*. Further studies of set versus perceptual defense.

### Clinical Populations

WALTER L. WILKINS, *Saint Louis University*,  
Chairman

WILSON H. GUERTIN, *Medical Service of the Supreme Bench of Baltimore*, AND ARNOLD D. KRUGMAN, *VA Hospital, Knoxville, Iowa*. A factor analytic evaluation of the concept of hospital adjustment.

GEORGE W. ALBEE AND DAVID VOLK, *Western Reserve University*, and *Highland View Hospital, Cleveland*. Stimulus boundedness in hemiplegics as reflected in a space perceptual test.

NATHAN CAPLAN AND DONALD L. GRANT, *Western Reserve University*, and *Highland View Hospital, Cleveland*. After effects of eye-muscle strain on space perception in hemiplegics and normals.

JAN H. BRUELL AND MIECZYSLAW PESZCZYNSKI, *Western Reserve University*, and *Highland View Hospital, Cleveland*. Perception of verticality as an aid in the differential diagnosis of brain injury.

CHARLES WENAR, *University of Illinois College of Medicine*. The effects of a motor handicap on integrative ability.

BERNARD H. LIGHT AND JEAN HOLLANDSWORTH AMICK, *West Virginia University*. Rorschach responses of normal aged.

ERNEST L. V. SHELLEY, *Boys Vocational School, Lansing, Michigan*. Psychological services in state schools for delinquent boys.

### Animal Learning

W. J. ARNOLD, *University of Nebraska*, Chairman

SUMNER C. HAYWARD, *Carleton College*. The effect of infant avoidance training on the sexual behavior of the mature male albino rat.

ABRAM AMSEL, *Tulane University*. The relations of the frustration effect to antecedent goal factors.

JAMES A. DINSMOOR, *Indiana University*. Stimulus intensity, and duration of subsequent nonstimulation, in training rats to terminate shock.

ALEXANDER M. BUCHWALD AND HARRY G. YAMAGUCHI, *Indiana University*. The effect of change in drive level on habit reversal.

SOLOMON WEINSTOCK, *Indiana University*. Acquisition and extinction of a partially reinforced running response at a twenty-four hour inter-trial interval.

DONALD W. LAUER, *Indiana University*. Progressive changes in response measures over repeated acquisitions and extinctions of a running habit.

JUDITH P. FRANKMANN, *Indiana University*. The effect of amount of interpolated learning, and time interval before test, on retroactive inhibition in rats.

M. E. FITZWATER, ARTHUR A. GREENFIELD, AND JOYCE LUDECKER, *Bowling Green State University*. Learning as a function of regular and simulated day-night running schedules.

### Discrimination Learning in Animals

JAMES A. DINSMOOR, *Indiana University*, Chairman

LAWSON H. HUGHES, *Indiana University*. The formation of a discrimination in relation to saccharin solution used as reinforcement.

REED LAWSON, *University of Missouri*. Absolute brightness discrimination performance as a function of amount of incentive.

HAROLD BABB AND SHIRLEY ANN NIEMEYER, *Coe College*. The learning of stimulus complexes as affected by reverse training to differentially discriminable components.

G. ROBERT GRICE AND HERBERT M. GOLDMAN, *University of Illinois*. Generalized extinction and secondary reinforcement in visual discrimination learning with delayed reward.

R. W. LEARY, *University of Washington School of Medicine*. Analysis of successive and simultaneous discrimination in the monkey.

CHARLES L. DARBY, *Purdue University*. The influence of observation on discrimination learning in the rhesus monkey.

A. J. RIOPELLE, W. F. SHELL, AND D. MIDDLETON, *Emory University*. Size and position cues in discrimination learning.

### Probability Learning

JOHN W. COTTON, *Northwestern University*, AND DOUGLAS ELLSON, *Indiana University*, Chairmen

NORMAN ANDERSON, *University of Wisconsin*. Effect of instructions and intertrial interval in a verbal conditioning situation.

LOWELL M. SCHIPPER, *Ohio State University*. The prediction of a particular event as a function of

- the relative occurrence of that event and the number of alternative events.
- L. BENJAMIN WYCKOFF, JR., JOSEPH SIDOWSKI, AND LEON TABORY, *University of Wisconsin*. The influence of reinforcement and punishment in a minimal social situation.
- ISRAEL GOLDIAMOND, *University of Chicago*. Serial effects as a function of the type of indicator used.
- STANLEY C. RATNER, *Indiana University, Southeastern Center*. Partial reinforcement in a barpressing, goal-responding situation with humans.
- ROBERT H. HICKSON AND TERESA CARTERETTE, *Indiana University*. Asymptotic response probability under two conditions of random reinforcement, using a noncorrection procedure.
- MARCIA D. MADISON AND WILLIAM K. ESTES, *Indiana University*. Probability learning with ambiguity in the reinforcing stimuli.
- EDITH D. NEIMARK, *Tulane University*. Toward the coordination of signal-duration effects to the slope parameter of a verbal conditioning model.
- ROBERT E. MORIN, *University of Texas*. Factors influencing rate and extent of learning in the presence of misinformative feedback.
- WARD EDWARDS, *AFPTRC, Lowry Air Force Base*. Sequential dependencies in two-alternative learning.
- VAUGHN J. CRANDALL, *Fels Research Institute*, AND DAN SOLOMON AND RICHARD KELLOWAY, *Antioch College*. The effects of objective probability and reinforcement value on expectancy statements and decision time.
- LAWRENCE M. STOLUROW, *University of Illinois*. Stimulus sequence and concept learning.
- DONALD M. JOHNSON AND PHILIP K. JENSEN, *Michigan State College*. Differential effects of distraction on thinking.

### Validity of Clinical Assessments

- DONALD FISKE, *University of Chicago*, Chairman
- JOHN J. CONGER AND WILLIAM L. SAWREY, *University of Colorado School of Medicine*, AND LEONARD F. KRAUSE, *Denver University*. A reanalysis of Beck's "six schizophrenias."
- LOREN J. CHAPMAN, *University of Chicago*. Loss of set in the conceptual performance of schizophrenics.
- BERT KAPLAN AND STANLEY BERGER, *University of Kansas*. Increments and consistency of performance in four repeated Rorschach administrations.
- GUINEVERE S. CHAMBERS, *Western Psychiatric Institute, University of Pittsburgh*. An investigation of the validity of judgments based on "blind" Rorschachs.
- HORACE A. PAGE AND CONRAD NUTHMANN, *University of Wisconsin*, AND JOHN THURSTON, *VA Hospital, Madison, Wisconsin*. An empirical study of the relationship of four classes of body habitus to responses on the MMPI.
- ARMIN GRAMS, *DePaul University*, AND LAWRENCE RINDER, *Illinois State Training School for Boys*. Machover signs as predictors of homosexuality.
- RALPH M. REITAN, *Indiana University Medical Center*. The Trail Making Test: a short, practical test for organic brain damage.
- PETER F. BRIGGS, *University of Minnesota*. Preliminary validation of a standard personal history for psychiatric diagnosis.
- DAVID BAKAN, *University of Missouri*, Chairman
- ALLEN D. CALVIN, FREDERIC K. HOFFMAN, AND EDGAR L. HARDEN, *Michigan State College*. The effect of intelligence and social atmosphere on group problem-solving behavior.
- HARRY M. MASON, *University of Illinois*. Methods of item analysis suited to evaluation of bases for answer selection.
- THOMAS C. ROWAN, *University of Michigan*. A multidimensional study of semantic relations.
- MARVIN H. DETABEL, *University of Illinois*. Probabilities of success and amounts of work in a multi-choice situation.
- ROBERT GLASER, *American Institute for Research*. Patterns of diagnostic problem-solving behavior.
- JEROME L. MYERS, *University of Wisconsin*. The effect of an intervening task on reacquisition of radar targets.
- MAYNARD W. SHELLEY, II, AND CLINTON B. DESOTO, *University of Wisconsin*. Response changes under conditions of contingent, single, and multiple signalling.

### Perceptual Learning

A. A. LUMSDAINE, *AFPTRC, Chanute Air Force Base*, Chairman

JOHN ALFRED LEONARD AND PAUL M. FITTS, *Ohio State University*. A transfer study with visual patterns.

LEOPOLD O. WALDER, *VA Hospital, Knoxville, Iowa*. Incidental learning in a discrimination problem.

ERNEST Z. ROTHKOPF, *AFPTRC, Chanute Air Force Base*. Retroactive inhibition and a test of deductions from an excitation-inhibition paradigm of discrimination learning.

ARTHUR L. BRODY, *Indiana University*. Simple human learning as a function of previous extinction and acquisition series.

#### Educational Practices

ARMIN GRAMS, *DePaul University*, Chairman

EVA D. FERGUSON, *Northwestern University*. An evaluation of two types of kindergarten attendance programs.

EUGENE E. LEVITT, *State University of Iowa*. Punitiveness, "causality," and intelligence of elementary school children.

T. L. ENGLE, *Indiana University, Fort Wayne Center*. Some problems of and methods used in teaching psychology in high schools.

JAMES C. REED, *Wayne University*. Some effects of short-term training in reading under conditions of equated motivation.

ALBERT ELKIN, *University of Kansas City*. The course in general psychology and change in student attitudes.

ROLLIN M. PATTON, *University of Akron*, AND PRISCILLA MEYER, *Chillicothe VA Hospital*. Teaching practices of best and worst college professors, as shown by a forced-choice rating scale.

#### Predictive Validity of Personnel Tests

A. A. CANFIELD, *Wayne University*, Chairman

NORMAN A. CROWDER AND EDWARD J. MORRISON, *AFPTRC, Lowry Air Force Base*. Joint factorization of aptitude tests with proficiency tests and criterion variables.

ROBERT G. DEMAREE, *AFPTRC, Lowry Air Force Base*. An analysis of intercorrelations among proficiency and criterion variables for electronic maintenance personnel.

H. E. KLUGH AND A. W. BENDIG, *University of Pittsburgh*. The validity of anxiety and temperament measures in predicting college achievement.

ROBERT D. DUGAN AND DONALD E. BAIER, *Commonwealth Life Insurance Company*. Tests and performance in a sales organization.

MARVIN D. DUNNETTE, *University of Minnesota*. Reliability and validity report on the Minnesota Engineering Analogies Test.

#### Comparative

HARRY W. HARLOW, *University of Wisconsin*, Chairman

BEATRICE GELBER AND ELLEN RASCH, *University of Chicago*. Investigations of the behavior of *P. aurelia*. V. Effects of autogamy (nuclear reorganization).

DONALD R. MEYER, *Ohio State University*. The monkey as a pure strategist.

RAYMOND C. MILES, *University of Wisconsin*. Learning-set formation in the marmoset, the squirrel monkey, and rhesus macaque.

CHRIS KORONAKOS AND WILLIAM J. ARNOLD, *University of Nebraska*. The formation of learning sets in rats.

#### Experimental Studies of Anxiety

JANET TAYLOR, *Northwestern University*, Chairman

WILLIAM C. BECKWITH AND HOWARD F. HUNT, *University of Chicago*. The effects of electroconvulsive shock and severe pain upon the retention of a discrimination based on punishment.

LEON S. OTIS, *University of Chicago*. The effect of electroconvulsive shock on an experimentally induced "conflict."

MICHAEL M. REECE AND JOHN P. DERR, *Wayne University*. Recognition and manifest anxiety.

AMBALAL S. PATEL, DAVID A. GRANT, AND ROY F. KUBOYAMA, *University of Wisconsin*. Interactions of anxiety (Taylor Scale) and anxiety-producing stimuli on performance on the Wisconsin Card Sorting Test.

LAVERNE C. JOHNSON AND JOHN A. STERN, *Washington University School of Medicine and Malcolm Bliss Hospital*. Rigidity on the Rorschach and response to intermittent photic stimulation.

EDWIGES DE C. FLORENCE, *Ohio State University*. Uncertainty, tension, and learning.

DURAND F. JACOBS, *VA Hospital, Marion, Indiana*. The effects of forced recall conditions on the reporting of anxiety-provoking material.



JEROME C. BEAM AND J. McV. HUNT, *University of Illinois*. The effects of reality-stress upon serial learning and conditioning.

### Personality

CHARLES WENAR, *Illinois Neuropsychiatric Institute*, Chairman

FRED DE WIT, *University of Illinois*. An approach to the measurement of values.

DAN C. OVERLADE, *University of Minnesota*. Humor: its relation to abstraction.

LEONARD BERKOWITZ, *AFPTRC, Randolph Air*

*Force Base*. Individual differences in susceptibility to group pressures.

MILTON ROKEACH, *Michigan State College*. Left and right intolerance in relation to dogmatism and the authoritarian personality.

JOHN E. WILLIAMS, *Yale University*. Relation of two types of induced failure to achievement orientation.

JOHN A. STARKWEATHER, *Northwestern University*. The communication value of content-free speech.

RICHARD R. CLAMPITT, *State University of Iowa*. An experimentally controlled investigation of the effect of group therapy.

# PROCEEDINGS OF THE TWENTY-SIXTH ANNUAL MEETING OF THE EASTERN PSYCHOLOGICAL ASSOCIATION

GORHAM LANE, *Secretary*  
*University of Delaware*

THE twenty-sixth annual meeting of the Eastern Psychological Association was held on April 15 and 16, 1955 at the Benjamin Franklin Hotel, Philadelphia, Pennsylvania. A total of 1,325 persons registered at the meeting. Of these, 698 were members of the Association, 365 were guests, and 262 were new members who joined the Association at the meeting. The present active membership of the Association totals 2,608.

William C. H. Prentice was in charge of local arrangements for the meeting. He was assisted by Joe K. Adams, Elliott Danzig, Norman Gekoski, Eugene Galanter, and Julius Wishner. The Program Committee, consisting of E. J. Shoben, Jr., chairman; Eliot Stellar and Malcolm Preston, scheduled 149 scientific papers (presented in 20 sessions), 4 symposia, 4 special meetings, 3 invited addresses, and 3 films. B. F. Skinner presented the annual Presidential Address entitled "A Case History in Scientific Method."

Among the more significant items transacted at the Annual Business Meeting and at the Board of Directors Meeting were the following:

1. Clarence Graham was elected President (1955-56) and Francis W. Irwin and William N. Schoenfeld were elected to the Board of Directors (1955-58).

2. The following appointments were made: Committee on Local Arrangements, Elliott Danzig, chairman; Program Committee, James Deese, to serve with E. J. Shoben, Jr. and Malcolm Preston, chairman; Membership Committee, David McClelland, to serve with Kay C. Montgomery; Elections Committee, Nathan Maccoby, to serve with B. F. Skinner; Auditing Committee, Morgan Upton and William Mollenkopf; Representative to AAAS Council, Herbert Rogers, to serve with Neal E. Miller; and Representatives to the American Academy of Political and Social Science, Norman O. Fredericksen and Douglas Courtney. Gorham Lane was re-elected Secretary for 1955-58.

3. The report of the Secretary, having been distributed to the Board Members prior to the meeting, was approved.

4. It was announced that the meetings for 1956 would be held at Chalfonte-Haddon Hall in Atlantic City on March 23 and 24. The 1957 meetings were scheduled to be held at the Hotel Statler in New York City on April 12 and 13.

5. Eight non-APA members were approved for membership and one was rejected.

6. The Association voted to express its thanks to the Committee on Local Arrangements and to the Hotel Benjamin Franklin.

7. The interim report and budget were presented by the Treasurer, Norman O. Frederiksen. Both reports were approved. The Treasurer's audited financial statement for the fiscal year 1954-55 follows:

## FINANCIAL STATEMENT AS OF MAY 1, 1955

### *For the Fiscal Year 1954-1955*

#### INCOME

Membership dues .....	\$2,193.00
Exhibitors fees .....	505.00
Guest fees .....	365.00
Sale of programs .....	36.50
Interest on savings account .....	49.56
Total income .....	\$3,149.06

#### EXPENDITURES

Fee to APA for placement service ....	\$ 100.00
Publication of proceedings .....	292.42
Office of the Secretary .....	1,420.50
Printing, supplies, postage, telephone .	990.87
Program committee .....	55.81
Travel expenses of officers .....	60.08
Expenses for annual meeting .....	570.17
Miscellaneous .....	25.00
Total expenditures .....	\$3,514.85
Deficit for 1954-1955 .....	\$ 365.79

## BALANCE SHEET

Cash:	Bank of New York .....	\$1,193.54
	New York Savings Bank ....	2,437.43
	Total cash .....	\$3,630.97
Capital:	As of May 1, 1954 .....	\$3,996.76
	Deficit for 1954-1955 .....	365.79
	Total capital .....	\$3,630.97

We, the Auditing Committee for the year 1954-55, have examined the records in connection with this statement and find it to be a true and correct account.

Signed .....  
 WILLIAM G. MOLLENKOPF      MORGAN UPTON

## PROGRAM

## Brain Lesions

HANS-LUKAS TEUBER, *New York University College of Medicine*, Chairman

Alterations in tachistoscopic thresholds in patients with field defects due to cerebral damage. M. POLLACK, W. S. BATTERSBY, AND M. B. BENDER, *Mt. Sinai Hospital, New York*.

Effects of lesions of the nervous system upon the perception of autokinetic movement. W. S. BATTERSBY, R. KAHN, M. POLLACK, AND M. B. BENDER, *Mt. Sinai Hospital, New York*.

Defective tactile identification in patients with cerebral lesions. R. JAFFE, M. B. BENDER, AND W. S. BATTERSBY, *Mt. Sinai Hospital, New York*.

Learning of a tactile pattern discrimination after brain injury. LILA GHENT, S. WEINSTEIN, JOSEPHINE SEMMES, AND H. L. TEUBER, *New York University College of Medicine*.

Psychological effects of major cerebral excision-intellectual and emotional changes following hemispherectomy. ADAM MUNZ AND ALEXANDER TOLOR, *Columbia-Presbyterian Medical Center*.

The thalamus and the perception of time. E. A. SPIEGEL, C. W. ORCHNIK, H. FREED, AND H. T. WYCIS, *Temple University*.

The effect of area 24 ablation on avoidance learning in the Rhesus monkey. R. A. PATTON, CHARLES HAMILTON, AND Y. D. KOSKOFF, *Montefiore Institute for Research and the University of Pittsburgh*.

Comparison of the effects of resections of rhinencephalic with those of lateral cortex on conditioned avoidance of monkeys. L. WEISKRANTZ AND K. H. PRIBRAM, *Institute of Living*.

## Human Learning

HALSEY M. MACPHEE, *University of Delaware*, Chairman

Specificity of adaptation of the galvanic skin response to tones differing in intensity. ROBERT E. EDWARDS, *Rensselaer Polytechnic Institute*.

The nature of the orienting task as a variable in intentional and incidental learning. PAULINE AUSTIN ADAMS AND LEO J. POSTMAN, *Swarthmore College and University of California at Berkeley*.

The role of information, frequency and effect in verbal discrimination learning. RICHARD D. WALK, *Cornell University*.

Paired-associate learning as a function of varying proportions of reinforcement. CHURCHILL H. MORGAN, *University of Massachusetts*.

Multidimensional scaling of stimuli based upon intrusion errors in paired-associates learning. ROGER N. SHEPARD, *Yale University*.

The bowed serial position curve as a function of perceptual organization. JULIUS WISNER, THOMAS E. SHIPLEY, JR., WILLIAM ROSENBLITH, AND MARVIN HURVICH, *University of Pennsylvania*.

Motor performance as a function of coordination and perceptual requirements of the task. OLIN W. SMITH, *Cornell University*.

Form discrimination as a function of type of previous experience with discriminating responses. HAROLD W. HAKE AND CHARLES W. ERIKSEN, *The Johns Hopkins University*.

## General Experimental I

ALPHONSE CHAPANIS, *The Johns Hopkins University*, Chairman

Measuring a lower bound of information transmission through the human channel. J. E. KARLIN AND J. R. PIERCE, *Bell Telephone Laboratories*.

Information transmission as a function of adaptation level. HAROLD P. VAN COTT, *Vision Branch, U.S.N. Medical Research Laboratory*.

Scales of perceptual response alternatives, in units of stimulus "information." EDWARD H. MCALISTER AND JULIAN E. HOCHBERG, *Cornell University*.



Immediate vs. delayed psychophysical judgments of weights. HERBERT BARRY, III, *Yale University*.

Shift in judgment of weights as a function of anchoring stimuli and instructions in early schizophrenics and "normals." KURT SALZINGER, *Columbia University*.

Steps toward the empirical construction of the sensory order for color based on an axiomatic theory of order and measure. EUGENE H. GALANTER, *University of Pennsylvania*.

An evaluation of a method for developing ratio scales. TRYGG ENGEN, *Brown University*.

The effect of structure in response categories upon anchor effects in absolute judgments. CHARLES W. ERIKSEN AND H. W. HAKE, *The Johns Hopkins University*.

### SPECIAL MEETINGS

Psi Chi. MAX MEENES, *Chairman*

New Developments in Tabulating Equipment Applications to Tests and Measurements. IRVING LORGE, *Chairman*; GEORGE W. DICK, NATHAN JASPEN, DAVID R. SAUNDERS, MARION F. SHAYCOFT, AND MARTIN L. ZEIGLER.

Community Responsibilities of the Psychologist in Private Practice. ROBERT D. WEITZ, *Chairman*; ROSE W. MARKS, J. QUINTER HOLSOPPLE, ROBERT LINDNER, AND KERMIT OBERLIN.

The Psychometric Versus the Clinical Approaches to Management Evaluation. FREDERICK J. GAUDET, *Chairman*; DOUGLAS FRYER, NEAL J. ROURKE, AND WILLIAM W. WILKINSON.

### SYMPOSIA

Empirical and Theoretical Aspects of Anxiety Scales. GEORGE MANDLER, *Chairman*; EMORY L. COWEN, CHARLES W. ERIKSEN, AND SEYMOUR B. SARASON.

Persistent Problems in the Diagnosis of Cerebral Organic Dysfunction. FRED BROWN, *Chairman*; SEYMOUR KLEBANOFF, ROBERT KAHN, EDWIN A. WEINSTEIN, JACOB COHEN, AND ROBERT MORROW.

An Evaluation of the H-T-P in Relation to Other Projective Techniques. VYTAUTAS J. BIELIAUSKAS, *Chairman*; EMANUEL F. HAMMER, SELMA I. LANDISBERG, ZYGMUNT A. PIOTROWSKI, KAREN MACHOVER, AND FRED BROWN.

The Notion of the "Response" in Contemporary Psychological Theory. EUGENE H. GALANTER, *Chairman*; ROBERT R. BUSH, HENRY GLEITMAN, KAY C. MONTGOMERY, AND MURRAY SIDMAN.

### INVITED ADDRESSES

Psychological Issues in Civil Liberties by MARIE JAHODA. NEAL E. MILLER, *Chairman*, AND KENNETH CLARK, *Discussant*.

The Magic Number  $7 \pm 2$  by GEORGE MILLER. CHARLES N. COFER, *Chairman*, AND JEROME BRUNER, *Discussant*.

Neocortical Functions in Behavior by KARL PRIBRAM. CARL PFAFFMANN, *Chairman*, AND HANS-LUKAS TEUBER, *Discussant*.

### FILMS

A Long Time to Grow—Part II: Four-and Five-Year-Olds in School. L. JOSEPH STONE.

Two Dynamic Ambiguous Figures. KENNETH T. BROWN.

Circling Behavior in the BUE Mouse Strain. ROBIN CURTIS.

### Conditioning

GREGORY RAZRAN, *Queens College*, *Chairman*

The reduction in shock intensity required to produce "just noticeable" learning. BYRON A. CAMPBELL, *Harvard University*.

A technique for studying the preferability of schedules of intermittent reinforcement. R. J. HERRNSTEIN AND W. H. MORSE, *Harvard University*.

An analysis of responding under three different forms of fixed interval reinforcement. W. H. MORSE AND R. J. HERRNSTEIN, *Harvard University*.

The maintenance of escape behavior under fixed-ratio reinforcement. MICHAEL KAPLAN, *Creedmoor Institute for Psychobiologic Studies*.

Some effects of variable-interval and fixed-ratio reinforcement on the behavior of psychotic adults and children. OGDEN R. LINDSLEY, *Harvard Medical School, Department of Psychiatry, and Department of Mental Health, Commonwealth of Massachusetts*.

Some observations on the Greenspoon effect. WILLIAM CODY WILSON AND WILLIAM S. VERPLANCK, *Harvard University*.

The control of conversation by reinforcement. WILLIAM S. VERPLANCK, *Harvard University*.

Time discrimination in a free operant situation. MURRAY SIDMAN, *Army Medical Service Graduate School*.

### Motivation

ELIOT STELLAR, *University of Pennsylvania*,  
Chairman

The influence of amount of consummatory activity on alleyway behavior. J. W. KLING, *Brown University*.

The effectiveness of the hunger and thirst drives as cues. CLARK J. BAILEY, *Yale University*.

Reaction potential as a function of amount of consummatory activity. WILLIAM R. THOMPSON AND T. H. SCOTT, *Queen's University and McGill University*.

Approach-avoidance conflict in the rat under two levels of thirst motivation. A. H. BLACK, *Harvard University*.

Thirst induced or reduced, respectively, by minute injections of hypertonic NaCl or water into the ventricles of cats. NEAL E. MILLER, CLARK J. BAILEY, AND MELISSA L. RICHTER, *Yale University and Human Research Unit No. 1, Fort Knox, Kentucky*.

The effects of electrical stimulation in the septal area on runway and maze performance. JAMES OLDS, *McGill University*.

### Sensory Psychology

LORRIN A. RIGGS, *Brown University*, Chairman

Methodology of phosphene threshold determinations: some preliminary findings. BERNARD H. FOX, MARY MARGARET WILKINSON, AND CLARENCE L. TIPTON, *George Washington University*.

Integrated energy vs. peak energy in pure tone thresholds. A. I. RAWNSLEY, *USN Medical Research Laboratory, New London, Conn.*

The critical duration in visual brightness discrimination for retinal areas of various sizes. WILLIAM R. BIERSDORF, *Army Medical Service Graduate School*.

Spectral saturation and chromatic responses. LEO M. HURVICH AND DOROTHEA JAMESON, *Eastman Kodak Company*.

The area-intensity relation and retinal location in the human scotopic electroretinogram. GEORGE H. CRAMPTON AND JOHN C. ARMINGTON, *Army Medical Service Graduate School*.

Critical flicker fusion functions at various wave lengths for a unilaterally color blind subject. E. BERGER, C. H. GRAHAM, AND YUN HSIA, *Columbia University*.

Luminosity curves for normal and dichromatic subjects, including a case of unilateral color blindness. C. H. GRAHAM AND YUN HSIA, *Columbia University*.

"Neural" vs. photochemical adaptation. ROBERT M. BOYNTON AND GILLRAY KANDEL, *University of Rochester*.

### Human Problem Solution

ELIZABETH FEHRER, *Brooklyn College*, Chairman

A comparison between reversal and nonreversal shifts in concept formation tests involving two and four sorting categories. HOWARD H. KENDLER AND MARK S. MAYZNER, JR., *New York University*.

Theory and experiment on the acquisition of word meanings. ROSALIND L. FEIERABEND, *Yale University*.

Specificity of classificatory category as a variable in recall. RAVENNA MATHEWS HELSON AND ANNE COVER, *Smith College*.

Experimental clarification of variables confounded in Esper's 1925 study of language behavior. ARNOLD E. HOROWITZ, *Harvard University*.

Stimulus evolution in problem-solving behavior: an interbehavioral analysis. PAUL SWARTZ, *Hobart College*.

Shift in problem solving. SCARVIA B. ANDERSON, *Naval Research Laboratory*.

### Personality Processes

DAVID C. MCCLELLAND, *Wesleyan University*,  
Chairman

The Taylor Scale and conditioned discrimination. LEON J. KAMIN, *McGill University*.

Self concept conflict indicators and learning. FRED HEILIZER, EMORY L. COWEN, AND HOWARD S. AXELROD, *University of Rochester*.

Some relationships between defensiveness and discrepancies within the self concept. RUTH C. WYLIE, *Sarah Lawrence College*.

Consistency of personal performance in perception and concept formation. BEVERLY GOODMAN AND ROBERT A. HARRIS, *Brooklyn College*.

Personality correlates of behavioral stereotypy.

WILLA D. DINWOODIE, MARY C. POTTER, AND RAY HYMAN, *Harvard University*.

A study on "margin of safety." SEYMOUR WAPNER AND HEINZ WERNER, *Clark University*.

A developmental study on physiognomic perception. PETER E. COMALLI, JR., *Clark University*.

Prediction of family interaction from a battery of projective tests. DOROTHY TERRY SOHLER AND THEODORE LIDZ, *Yale University*.

### Social Psychology

SOLOMON ASCH, *Swarthmore College*, Chairman

Emergent leadership and attitudes in a simulated atomic attack—A methodological study. ELIOTT R. DANZIG AND ARTHUR I. SIEGEL, *Institute for Research in Human Relations*.

The expression of hostility by groups under attack. ALBERT PEPITONE, *University of Pennsylvania*.

Some attitudes of college students concerning the development of the hydrogen bomb. ROBERT A. HARRIS, HAROLD M. PROSHANSKY, AND EVELYN RASKIN, *Brooklyn College*.

The effects of a common ego ideal upon members' liking others and feeling liked in small groups. SEYMOUR LEVY, *University of Minnesota*.

Communication patterns and problem solving in small groups. SOL KLIER, *New York University*.

Group decision and employee participation. LOIS C. LAWRENCE AND PATRICIA CAIN SMITH, *Cornell University*.

A Bogardus variation for measuring perceived prejudice. F. LOYAL GREER AND ARTHUR I. SIEGEL, *The RAND Corporation and Institute for Research in Human Relations*.

Some hypotheses about prejudice: Can they be verified? CHARLES T. O'REILLY, *Family and Children's Society, Long Branch, New Jersey*.

### PRESIDENTIAL ADDRESS AND ANNUAL BUSINESS MEETING

HAROLD SCHLOSBERG, Chairman

Presidential Address: A Case History in Scientific Method. B. F. SKINNER.

### Animal Behavior

WALTER C. STANLEY, *Brown University*, Chairman

Delayed response and adaptive response learning in the canary. NICHOLAS PASTORE, *Queens College*.

Increased and decreased intensities of light as consequences of choices in the simple T-maze. NORMAN GREENFIELD, *University of Massachusetts*.

The effect of ECS on stereotyped behavior as a function of the duration of conflict. ROBERT S. FELDMAN AND CLAUDE C. NEET, *University of Massachusetts*.

A comparative investigation of the Ovsiankina effect. W. A. S. SMITH AND EUGENE H. GALANTER, *University of Pennsylvania*.

Discrimination learning as a function of reversal and nonreversal shifts. ROGER T. KELLEHER, *New York University*.

Adaptive responses and the contiguity principle. G. W. BOGUSLAVSKY, *Cornell University*.

Quantitative measurement of hereditary circling behavior in the BUD and BUE mouse strains: Standardization of two tests and changes in the behavior of adult mice as a function of age. ROBIN L. CURTIS, *Brown University*.

### Conditioning II

JAMES E. DEESE, *The Johns Hopkins University*, Chairman

The effects of shock intensity on avoidance learning in dogs. F. ROBERT BRUSH, *Harvard University*.

The effects of varying CS length in traumatic avoidance learning in dogs. ELINOR S. BRUSH, *Harvard University*.

The effect of delay of shock termination on traumatic avoidance learning in dogs. R. M. CHURCH AND R. L. SOLOMON, *Harvard University*.

Extinction of a running response, acquired under avoidance and escape procedures with the number of shock trials equalized. D. W. DEMOTT AND A. A. GERALL, *University of Rochester*.

Drive generalization from hunger to fear. DALE H. ORTMAYER, *Teachers College, Columbia University*.

A test of the drive-reduction explanation of learned fear. K. C. MONTGOMERY AND B. B. GALTON, *Yale University*.

A discrimination based upon repeated conditioning and extinction of avoidance behavior. JOHN J. BOREN AND MURRAY SIDMAN, *Army Medical Service Graduate School*.

Acquisition and extinction of conditioned "fear" as a function of shock intensity. JOSEPH V. BRADY AND GEORGE M. SUSLA, *Army Medical Service Graduate School*.



### Perception

W. C. H. PRENTICE, *Swarthmore College*,  
Chairman

Perceived distance as a function of visual perspective and mode of presentation. PATRICIA C. SMITH, OLIN W. SMITH, AND DOROTHY HUBBARD, *Cornell University* and *Columbia University*.

The effects of terrain and viewing distance on relative distance discrimination. JOHN L. KOBRICK, *HQ Quartermaster Research and Development Command, Natick, Massachusetts*.

A developmental study on the perception of verticality. HEINZ WERNER AND SEYMOUR WAPNER, *Clark University*.

The effect of monaurally and binaurally presented tones of different loudness levels upon the perception of verticality. KENNETH A. CHANDLER, *University of Bridgeport*.

Visual adaptation to chromatic dispersion. RICHARD HELD, *Brandeis University*.

A determination of the stimuli for involuntary eye movements. TOM N. CORNSWEET, *Brown University*.

Disturbance in visual function following prolonged perceptual isolation. B. K. DOANE, W. HERON, AND T. H. SCOTT, *McGill University*.

EEG changes during prolonged perceptual isolation. WOODBURN HERON AND B. K. DOANE, *McGill University*.

### Military and Industrial

RAYMOND KATZELL, *Richardson Bellows Henry and Company, Inc.*, Chairman

The effect of position, radius and loading upon the speed of rotating a control. P. B. SAMPSON, A. A. GERALL, AND R. F. GREEN, *University of Rochester*.

Interference effects in two-hand following tracking as a function of reversal of display-control relationship for one of the hands. B. G. ANDREAS, R. F. GREEN, AND S. D. S. SPRAGG, *University of Rochester*.

The relationship between arm-hand steadiness and the position of the extended arm and hand in the median plane. E. RALPH DUSEK, *HQ Quartermaster Research and Development Command, Natick, Massachusetts*.

Learning and retaining a rate of movement with the aid of kinesthetic and verbal cues. ROBERT S. LINCOLN, *The Johns Hopkins University*.

Performance and social characteristics associated with changes in the membership of medium bomber crews. DONALD G. FORGAYS AND BERNARD I. LEVY, *Crew Research Laboratory, Randolph Air Force Base, Texas*.

A study of instructor behavior during critiques of medium bomber crews. BERNARD I. LEVY, IRL A. IRWIN, AND EDMUND W. MILAUCKAS, *Crew Research Laboratory, Randolph Air Force Base, Texas*.

The effects of technical school training on the trouble-shooting ability of aviation electricians. ARTHUR I. SIEGEL, *Institute for Research in Human Relations*.

A structure of worker functions. SIDNEY A. FINE, *United States Employment Service*.

### Projective Techniques

THEODORA ABEL, *Postgraduate Center for Psychotherapy and Long Island University*,  
Chairman

Reliability of graphic indices in the draw-a-person test. DORIS RYAN, *Fordham University Graduate School*.

Perceptual and motor components of Bender-Gestalt test performance. HERMAN NIEBUHR, JR., AND DAVID COHEN, *University of Pennsylvania* and *Veterans Administration, Coatesville, Pennsylvania*.

The use of projective tests for prognosis in physical rehabilitation. LEONARD DILLER, *Institute of Physical Medicine and Rehabilitation, New York*.

A study of the effects and persistence of "set" directed towards an increase in color responses on the Rorschach in normal subjects. SIDNEY M. RAPPAPORT, *Temple University*.

The generality of scope and differentiation responses to the Rorschach. WILLIAM G. SHIPMAN, *University of Rochester*.

Rorschach's movement response as a measure of delaying capacity, fantasy, and planfulness. JEROME L. SINGER AND HAROLD WILENSKY, *F.D.R. Veterans Administration Hospital, Montrose, New York*.

Hostility in Rorschach content and overt aggressive behavior. ALAN P. TOWBIN, *Yale University*.

An intensive investigation of Rorschach diagnostic factors in schizophrenia. SHELDON FRIEDMAN, ARNOLD MOSKOWITZ, AND MILTON S. GURVITZ, *Hillside Hospital, Adelphi College, and The Jewish Community Services of Long Island.*

### Psychopathology

H. O. SCHMIDT, *Connecticut State Hospital,*  
Chairman

The performance of schizophrenic individuals with high and low levels of anxiety following frustration. NATHANIEL N. WAGNER, *Teachers College, Columbia University and The United States Army.*

Schizophrenia and central nervous system pathology. HAROLD J. FINE AND GLEN A. BRACKBILL, *Veterans Administration, Bridgeport, Connecticut and Palo Alto, California.*

Interpersonal skills of schizophrenics and drug addicts. M. DAVID DIAMOND, *Riverside Hospital, New York.*

Psychological diagnosis of intracranial pathology after accident. ALICE FRIEDMAN, *Lebanon Hospital, New York.*

The use of the Hewson ratios in the diagnosis of organic pathology. ALMA L. NICHOLAS AND WILLIAM N. THETFORD, *Institute of Living.*

Learning in aphasic patients. LEO KATZ, *Teachers College, Columbia University and Manhattan V.A. Hospital.*

Patient mobility as prognostic factor in mental disorders. JOSEPH ZUBIN, *Psychiatric Institute, Columbia University.*

Selection of chronic mental patients with discharge potential. F. HAROLD GIEDT AND RICHARD SANDERS, *Veterans Administration Hospital, Perry Point, Maryland.*

### Stress

DAVID ZEAMAN, *University of Connecticut,*  
Chairman

The effects of experimentally induced stress upon critical flicker frequency, palmar skin resistance and reversible figure fluctuations. MALCOLM KUSHNER, *Temple University.*

Individual differences in physiological reactivity to stress. PETER M. LEWINSOHN, *The Johns Hopkins University.*

The effect of subconvulsive audiogenic stress on recovery from physiological damage. BERNARD

F. RIESS AND DAVID SPAIN, *Post-Graduate Center for Psychotherapy and Waldemar Medical Research Foundation.*

The modification of emotional state and social behavior by sleep deprivation and drugs. VICTOR G. LATIES, *Brown University.*

The constriction of the perceptual field under stress. VIRGINIA I. SHIPMAN, *Pennsylvania State University.*

Duration of success background and the effect of failure upon performance. JAMES A. BAYTON, *Howard University.*

### General Experimental II

RAY HYMAN, *Harvard University,* Chairman

Masking by intermittent noise. IRWIN POLLACK, *Operational Applications Laboratory, Bolling Air Force Base, Washington, D. C.*

A factor analysis of tests for listening in noise. J. D. HARRIS AND B. H. COHEN, *USN Medical Research Laboratory, New London, Connecticut and The University of Connecticut.*

Exploratory study of human accuracy for counting sound pulses. ROBERT R. RIESZ, *Bell Telephone Laboratories.*

The effect of response latency on the serial effect. WILLARD F. DAY, *The Johns Hopkins University.*

A least squares solution for paired comparisons with incomplete data. HAROLD GULLIKSEN, *Educational Testing Service and Princeton University.*

The *k*-coefficient: design and trial application of a new technique for multivariate analysis. FRANK ROSENBLATT, *Cornell University.*

A comparison of two scaling techniques. NISSIM LEVY AND TRYGG ENGEL, *Brown University.*

### Animal Behavior II

FRANK FINGER, *University of Virginia,* Chairman

Some temporal factors in exploratory behavior. E. D. LOONEY, *Yale University.*

Optokinetic afternystagmus in the monkey. HOWARD P. KRIEGER AND MORRIS B. BENDER, *Mt. Sinai Hospital, New York.*

Activity as a function of a restricted drinking schedule. JOHN F. HALL, *The Pennsylvania State University.*

Training under two drives, alternately present vs. training under a single drive. LYMAN W. PORTER, *Yale University.*

The effect of an irrelevant drive on maze learning in the white rat. CARL E. WEDEKIND AND HARRY W. BRAUN, *University of Pittsburgh and Montefiore Institute of Research.*

Behavior controlled by food and shock concurrently. CHARLES B. FERSTER, *Harvard University.*

### General Clinical

ERNEST S. BARRATT, *University of Delaware,*  
Chairman

An evaluation of atomistic versus holistic approaches in the appraisal of industrial personnel. JOSEPH G. PHELAN AND RICHARD STANTON, *Stevens Institute of Technology.*

Psychologists' ability to predict responses to a personality questionnaire. MAURICE G. KOTT, *Department of Institutions and Agencies, Trenton, New Jersey.*

Q-technique applied to a patient and the therapist in a child guidance setting. PAUL FRISCH AND ROBERT CRANSTON, *Adelphi College.*

A method of dividing interviews into independent-clause units. FRANK AULD, JR., JOHN DOLLARD, AND ALICE M. WHITE, *Yale University.*

The use of clinical case records in research: a method of analysis and several applications. E. K. BELLER AND MARJORIE BEHRENS, *Council Child Development Center, New York.*

The use of 'ah' in spontaneous speech. GEORGE F. MAHL, *Yale University School of Medicine.*

Attitudes toward group therapy in a psychiatric clinic for alcoholics. BENJAMIN POPE, *Psychiatric Institute, University of Maryland.*

Intratest scatter of the block design subtest of the Wechsler-Bellevue as a discriminant of schizophrenia. SHIRLEY B. FELTMAN AND MILTON S. GURVITZ, *Hillside Hospital, Adelphi College, and The Jewish Community Services of Long Island.*

### Educational and Aesthetics

STUART COOK, *New York University,* Chairman

Measuring teacher behavior. CECIL A. GIBB, *Dartmouth College.*

The occurrence of animistic responses as a function of sentence context and set factors. ALVIN J. SIMMONS, *University of Massachusetts.*

Some personality variables related to college performance. THOMAS STORM AND IRVIN L. CHILD, *Yale University.*

Personality determinants (sex, age, intelligence) of attitudes toward colors in combinations. WALTER A. WOODS, *Richmond Professional Institute.*

The behavioral effects of environmental color. HUDSON J. BOND, *Applied Psychology Corporation, Washington, D. C.*

Color coding in a visual search task. BERT F. GREEN AND LOIS K. ANDERSON, *Lincoln Laboratory, Massachusetts Institute of Technology.*

Specification of the visual stimuli for experimental study of aesthetics. ESTELLE S. SINGER, *Yale University.*



# PROCEEDINGS OF THE TWENTY-FIFTH ANNUAL MEETING OF THE ROCKY MOUNTAIN BRANCH OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

JAMES W. TAYLOR, *Acting Secretary*  
*Veterans Administration Hospital, Denver*

THE Rocky Mountain Branch of the American Psychological Association held its twenty-fifth annual meeting on May 12th, 13th and 14th, 1955, at the University of Colorado, Boulder, Colorado. Over 200 members and guests attended.

The meetings were held in conjunction with the University of Colorado Symposium on Cognition. A regional meeting and luncheon was held by Psi Chi under the chairmanship of Dr. Anna Y. Martin, of New Mexico Highlands University.

Dr. Lawrence S. Rogers, President, served as Chairman of the business meeting. The next annual meeting will be held in conjunction with the Colorado-Wyoming Academy of Science meetings at the Colorado School of Mines, Golden, Colorado. Serious consideration will be given to the function of the Rocky Mountain Branch and means by which the region's professional needs can be served most adequately. It was decided that the organi-

zation should make a contribution to the APA building fund. The organization unanimously recorded its gratitude to the University of Colorado, and to Drs. Victor C. Raimy, Howard E. Gruber, Kenneth R. Hammond, and Richard Jessor for sponsoring and organizing the symposium, as well as for the courtesies and hospitalities shown during the meetings.

The following officers were unanimously elected for the ensuing year: President, Donald D. Glad, University of Colorado Medical School; President-Elect, Maurice P. Smith, University of Colorado; and Treasurer, James W. Taylor, Veterans Administration Hospital, Denver. Wilson J. Walthall, Jr., University of Wyoming, has spent the last year in Burma, and will continue to serve as Secretary. The organization unanimously recorded its thanks and gratitude to Lawrence S. Rogers and Virginia M. Brown for many years of devoted service.

## PROGRAM

### Thursday Morning

HOWARD GRUBER, Chairman

Welcome by Dr. WARD DARLEY, President of the University of Colorado.

KARL F. MUENZINGER: Opening address.

EGON BRUNSWICK (Paper read by Kenneth R. Hammond): Scope and aspects of the cognitive problem.

CHARLES E. OSGOOD: Discussion  
Panel Discussion

### Thursday Afternoon

JEROME BRUNER: Going beyond the information given.

FRITZ HEIDER: Discussion  
Panel Discussion

### Friday Morning

KENNETH HAMMOND, Chairman

CHARLES E. OSGOOD: A behavioristic analysis of perception and meaning as cognitive phenomena.

DAVID RAPAPORT: Discussion  
Panel Discussion

### Friday Evening

LEON FESTINGER: The relation between cognition and action.

JEROME BRUNER: Discussion  
Panel Discussion

### Saturday Morning

RICHARD JESSOR, Chairman

DAVID RAPAPORT: Cognition and consciousness.

LEON FESTINGER: Discussion  
Panel Discussion

### Saturday Afternoon

FRITZ HEIDER: Trends in cognitive theory and research—Prospects for the future.  
Panel Discussion

### Saturday Evening

Dinner. HENRY W. EHRLMANN, author, and Professor of Political Science: The modern study of politics.

# PROCEEDINGS OF THE FIRST ANNUAL MEETING OF THE SOUTHEASTERN PSYCHOLOGICAL ASSOCIATION

M. C. LANGHORNE, *Secretary-Treasurer*  
*Emory University*

## MINUTES OF THE FOUNDING MEETING

THE founding meeting of the Southeastern Psychological Association (from now on referred to as SEPA) was held Monday, September 6, 1954, 8:40-10:30 A.M. East Room, Statler Hotel, New York City, in conjunction with the 62nd annual meeting of the American Psychological Association. SEPA, which plans affiliation with APA, is largely the outgrowth of the work of John B. Wolfe of the University of Mississippi. Encouragement was lent his efforts especially by Dorothy C. Adkins, of the University of North Carolina, and by many other psychologists of the region as well. The Constitution was drawn by E. E. Cureton of the University of Tennessee.

The following psychologists attended the founding meeting: Donald K. Adams, Raymond C. Bice, Jr., Louis D. Cohen, Louise W. Cureton, W. G. Dahlstrom, J. F. Dashiell, Harold A. Delp, William L. Dunn, Stanford C. Ericksen, Hiram L. Gordon, Richard H. Henneman, William M. Hinton, William P. Hurder, W. N. Kellogg, M. C. Langhorne, William McGehee, Dannie J. Moffie, Joseph E. Moore, R. T. Osborne, W. S. Phillips, Lorine Pruette, Eliot H. Rodnick, Morris Roseman, Lawrence W. Ross, William N. Smith, T. F. Staton, Calvin R. Stevenson, Donald M. Taylor, John W. Thibaut, Thelma G. Voorhis, M. Kershaw Walsh, Ivor Wayne, and John B. Wolfe.

Temporary officers were elected to run the affairs of the Association under the Constitution until the election of permanent officers, as prescribed by the Constitution. These temporary officers were: President, John B. Wolfe; Vice-President, Dorothy C. Adkins; Secretary-Treasurer, M. C. Langhorne. Dues for the first year were set at \$1.00. It was decided that all members of APA who reside in, or whose place of principal employment is in Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Vir-

ginia, and Puerto Rico be invited to join SEPA. A rising vote of thanks expressed appreciation of those present for the preliminary work of Adkins, Cureton, and Wolfe.

## FIRST ANNUAL MEETING

The Southeastern Psychological Association held its first annual meeting Sunday through Tuesday, May 22-24, 1955, at the Biltmore Hotel, Atlanta, Georgia. Total registration was 268. Forty-five papers and four symposia were scheduled, in addition to the business meeting. The host institution was Emory University. Local arrangements were handled efficiently by Wiley S. Bolden, Katherine T. Omwake, M. Carr Payne; Oscar S. Adams, chairman. The Program Committee consisted of William M. Bevan, Jr., C. H. Calhoun, Edward H. Loveland; and M. C. Langhorne, chairman. Carl Rush, Jr., of the APA Central Office, assisted Louise W. Cureton and Edward H. Loveland with placement services.

## MINUTES OF THE ANNUAL BUSINESS MEETING

Temporary President Wolfe called the meeting to order at 10:45 A.M., Tuesday. The minutes of the founding meeting in New York, the minutes of the first Executive Committee meeting in New York, minutes covering the functioning of the Secretary's office from September, 1954, to May, 1955, were approved as read. The report of the Treasurer, as approved by the Auditing Committee, was accepted.

Several items of business were acted upon. Reports were made to the membership on the progress of affiliation with APA on two proposed constitutional amendments to be presented later by mail ballot; on expression of appreciation to APA for addressograph labels, for the fine work of Carl Rush, for the visit of Fillmore H. Sanford; it was reported that publication of minutes and program

in the *American Psychologist* has been authorized; that membership had reached 585. Annual dues for 1955-56 were set at \$2.00. A charter member of SEPA was defined as any member or affiliate joining the Association by the end of the first annual meeting. Dues for Student Affiliate Members were set at \$1.00. The Election Committee composed of W. T. James, Rolland H. Waters, and W. N. Kellogg, Chairman, reported on the mail ballot election of permanent officers and Executive Committee members as follows: President, John B. Wolfe; President-Elect, Nicholas Hobbs; Secretary-Treasurer, M. C. Langhorne; one-year-term member-at-large of the Executive Committee, Arthur W. Combs; two-year-term, J. F. Dashiell; three-year-term, C. H. Calhoun.

Invitations to the Association for the 1956 meeting were presented by Wilse B. Webb, from Ad-

miral Harris of the Naval Air Force Basic Training Command to hold the meeting in Pensacola; informal invitations came from Puerto Rico and Jackson, Mississippi; formal invitations came from Miami and Atlanta. It was decided to hold the next annual meeting in Atlanta on Sunday, Monday, and Tuesday, April 29, 30, May 1, 1956, with the Biltmore Hotel as headquarters.

SEPA unanimously recorded its gratitude to Emory University for its hospitality; to the Biltmore Hotel; to the Atlanta Convention Bureau; to the Atlanta newspapers, TV and radio stations; to the Election, Program, and Placement Service Committees; to the Temporary Officers; to the Committee on Local Arrangements, especially its chairman, Oscar S. Adams; for their effective functioning and cooperation. The meeting adjourned at 12:30.

## PROGRAM

### Symposium I. The Roles of Psychological Organizations

J. F. DASHIELL, Moderator

The role of the national psychological association.

FILLMORE H. SANFORD, *Executive Secretary, American Psychological Association.*

The role of the regional organization. JOHN B. WOLFE, *Temporary President, the Southeastern Psychological Association.*

The role of the state organization. GILBERT J. RICH, *Director, Roanoke, Va., Guidance Center.*

The Southern Regional Education Board's Mental Health Project as related to the professional psychological organization. NICHOLAS HOBBS, *Chairman, Division of Human Development and Guidance, George Peabody College for Teachers.*

### Symposium II. Research in Progress

STANFORD C. ERICKSEN, Moderator

Business and industrial psychology. RICHARD W. HUSBAND, *Florida State University.*

Clinical psychology. LOUIS D. COHEN, *Duke University.*

Comparative psychology. ARTHUR J. RIOPELLE, *Emory University.*

Experimental psychology. RICHARD H. HENNEMAN, *University of Florida.*

Social psychology. E. LLEWELLYN QUEENER, *Southwestern-at-Memphis.*

### Learning I

EDGAR L. SHRIVER, Chairman

Resistance to extinction as a joint function of the number and proportion of reinforcements.

RALPH MCC. CHINN, *Emory University.*

Serial learning and number of response alternatives.

OSCAR S. ADAMS, *Emory University*, and JAMES M. RICHARDS, JR., *Vanderbilt University.*

Distribution of practice and within-periods performance. ROBERT B. AMMONS, CHRIS STONE, AND CAROL AMMONS, *University of Louisville.*

A comparison of the maze learning performance of the golden hamster and the albino rat. JOHN A. BOWLAND AND ROLLAND H. WATERS, *University of Florida.*

The effects of reserpine upon a conditioned avoidance response in monkeys. RICHARD P. SMITH AND ALTHEA I. WAGMAN, *Emory University.*

### Perception

C. W. MANN, Chairman

Relation of presentation distance to perceived size and weight. HOWARD BARTLEY, *Michigan State College.*

Optimal symbolic Arabic numerals from an eight-element straight-line matrix. EARL A. ALLUISTI, *Ohio State University.*

Personalities in faces: VIII. Negroidness and prejudice as factors in accentuation of the Negro



stereotype. PAUL F. SECORD, WILLIAM BEVAN, JR., AND BRENDA KATZ, *Emory University*.  
 Analysis of patterns of response of anxious and non-anxious subjects to a flickering light. ROBERT A. WAGONER AND LOUIS D. COHEN, *Duke University*.

### Clinical I

M. B. JENSEN, Chairman

The development of an objective Rorschach inquiry. E. EARL BAUGHMAN, *University of North Carolina*.  
 A study of the factors related to self-deception. JOHN A. HORNADAY, *Shorter College*.  
 The performance of hospitalized psychiatric patients on the ego-strength scale of MMPI. HERBERT QUAY, *Milledgeville, Georgia, State Hospital*.  
 Advantages and disadvantages of the co-therapy method in group psychotherapy—the opinions of the co-therapists. MORRIS ROSEMAN, *Roanoke, VA Hospital*.

### Personality

GERALD L. PASCAL, Chairman

The self concept and its related measures. DANIEL W. SOPER AND ARTHUR W. COMBS, *University of Florida*.  
 Reliability, validity, and stability of sociometric ratings. JUNIUS A. DAVIS, *Emory University*, AND CHARLES F. WARNATH, *TC, Columbia University*.  
 A study of the attitudes of adult male schizophrenic and normal subjects toward the mother-son relationship. JESSE G. HARRIS, *Duke University*.  
 Status needs and performance under failure. OSCAR A. PARSONS, *Duke University*.

### Learning II

M. KERSHAW WALSH, Chairman

The influence of novelty on choice-point behavior in the rat. WILLIAM I. GARDNER AND JOHN B. WOLFE, *University of Mississippi*.  
 A premonitory cue and the effectiveness of delayed punishment. W. F. DUKES, *University of California at Davis*, AND WILLIAM BEVAN, JR., *Emory University*.  
 Learning sets in Platyrrhine monkeys. W. F. SHELL, *Emory University*.

The effects of forcing in a T-maze at several levels of food deprivation. PASCHAL N. STRONG, JR., *Durham VA Hospital*.

### Clinical II

THEODORE LANDSMAN, Chairman

A test of the validity of psychiatric diagnoses. GEORGE H. FRANK, *Florida State University*.  
 A graphic method for showing therapeutic change by use of MMPI factor scales. GEORGE S. WELSH, *University of North Carolina*, AND MORRIS ROSEMAN, *Roanoke VA Hospital*.  
 The psychologist in the community clinic team as seen by a psychiatrist. GILBERT J. RICH, *Roanoke Guidance Center*.  
 The role of the psychologist in the community clinic—Problems and procedures in a private out-patient service clinic. THEODORE H. BLAU, *Byron Harless and Associates, Tampa*.  
 Nonpatient gestalt therapy. ARISTOTLE T. PAPAS, *Atlanta, Georgia*.

### Personnel

JOSEPH E. MOORE, Chairman

Report of research on the naval aviator. WILSE B. WEBB, *USN Aviation Psychology Laboratory, Pensacola*.  
 Relationship between biographical information blank and first semester grades. CHARLES F. ELTON, *University of Mississippi*.  
 Differences in logical reasoning scores between male college graduates 20–29 years of age and male college graduates 30–39 years of age, all of whom were applicants for employment in the Federal government. ANTONIA BELL MORGAN, *Aptitude Associates, Merrifield, Va*.  
 The stability of scores on a test of logical reasoning. WILLIAM J. MORGAN, *Aptitude Associates, Merrifield, Va*.

### The School Psychologist

WILLIAM M. HINTON, Chairman

The psychologist in the school system. NATHAN FARBER, *University of Florida*.  
 The role of the school psychologist as a clinician. ARTHUR W. COMBS, *University of Florida*.  
 Report on the APA Thayer Conference on School Psychology. SUSAN W. GRAY, *George Peabody College for Teachers*.

**Motivation**

RICHARD H. HENNEMAN, Chairman

Variable behavior in relation to needs and incentives: a theoretical schema. C. G. SCREVEN, *University of Mississippi*.

The effect of punishment on exploratory behavior in the white rat. S. SPIEGEL AND ROLLAND H. WATERS, *University of Florida*.

The effect of emotionality upon the food intake of the rat. NORMAN R. ELLIS, SIDNEY A. WOHL, AND PAUL S. SIEGEL, *University of Alabama*.

Attitudes of university students towards cheating. WILLIAM F. ANDERSON, JR., *University of Alabama*.

**Physiological Psychology**

W. N. KELLOGG, Chairman

Temporal summation as a theoretical basis of apparent motion. E. P. HORNE, S. R. WILSON, R. T. SAUCER, AND N. REICHENBERG, *University of Florida*.

The occurrence of convulsions in rats in the absence of auditory stimulation. WILLIAM J. GRIFFITHS, JR., *University of Mississippi*.

Performance of normal, operated, and radiated monkeys on delayed reaction and avoidance learning. MILTON A. GRODSKY, *Emory University*.

The dependence of eating behavior on saccharine and sucrose intake. RINAH TOFIELD, T. F. GILBERT, AND W. T. JAMES, *University of Georgia*.

**General**

EMILY S. DEXTER, Chairman

A study of the personality organizations of a selected group of highly creative chemists and mathematicians. PAUL I. CLIFFORD, *Atlanta University*.

Comparison of listening to questions and reading questions as means of testing knowledge of psychology. FREDERICK L. WESTOVER, *University of Alabama*.

Subcultural performance on the draw-a-man test. FREDERIC T. SCHLAMP, *Florida State University*.

Factors involved in expression of dominance among puppies. W. T. JAMES, *University of Georgia*.

**Social Hour**

Hosts: Emory University Department of Psychology

**Symposium III. Community Mental Health**

ELIOT B. RODNICK, Moderator

The role of the psychologist in the state mental institution. CARL A. BRAMLETTE, *South Carolina State Hospital, Columbia*.

The role of the psychologist in the community clinic. JOHN M. MCKEE, *Alabama Division of Mental Health, Montgomery*.

The role of the psychologist in the school. JAMES E. GREENE, *University of Georgia*.

The role of the psychologist in business and industrial mental health. EARL E. SWARTZLANDER; *Rohrer, Hibler, and Replogle, Atlanta*.

The role of research in community mental health. JAMES C. DIXON, *University of Florida*.

**Symposium IV. The Teaching of Psychology in Colleges and Universities**

FRANK W. FINGER, Moderator

Psychology in the small liberal arts college. STANLEY B. WILLIAMS, *College of William and Mary*.

Vitalizing the teaching of psychology. W. G. WORKMAN, *Davidson College*.

The training of psychologists for colleges and universities. BRUCE V. MOORE, *Education and Training Board*.

## Psychology in the States

### Legislative Activity in Washington

On June 9 Washington became the ninth state to acquire legislation relating to the practice of psychologists.<sup>1</sup> The problem of legislation is of concern to many states and yet there have been, from the states which have succeeded in getting bills passed, few published reports of procedures used or special difficulties encountered. It is clear that a tactical program, successful in one state, may not be effective in others, and yet there should be some principles common to all situations. For this reason the Legislative Committee of the Washington State Psychological Association feels that a brief account of experiences in this state might be of value to those who are continuing to work on the problem.

Interest in the general topic of legislation in Washington began in 1947, and continued in the form of panel discussions and debates until 1951, when a licensing bill was drafted and presented to the WSPA for approval. Because of certain well-known developments in APA attitudes and policies toward legislation, no agreements could be reached and interest shifted toward certification as a more realistic alternative.

In May, 1952, the State Association unanimously endorsed a draft of a certification bill and instructed its committee on legislation to introduce it into the 1953 biennial legislative session. Action was delayed and the bill was not introduced in 1953.

Prior to the 1955 legislative session, a newly organized committee presented its intentions to the Washington State Medical Association. The WSMA assurance that its attitude would be determined by AMA policies was encouraging, inasmuch as the Gerty reports<sup>2</sup> did not suggest opposition to certification for psychologists. Nevertheless, there was opposition to our bill from the WSMA as we prepared to introduce it into the House of Representatives. As a result, the bill was promptly moved over to the Senate, as it was felt that we could get stronger support there in terms

of committee personnel and the friendliness of certain prestige senators.

The opposition could not be evaded, but after three weeks of constant pressure of many sorts, the bill got through the Medicine and Dentistry Committee of the Senate. It was voted down once in the Rules Committee, reconsidered, and finally passed the Senate with a large majority, chiefly as a result of valuable floor support from some influential members of that body.

Survival of the bill during hearings in the House Committees most certainly may be attributed to phone, wire, and personal contacts by many members of the Association. Strategic influence at critical times came through a few friendly psychiatrists and general practitioners. Final passage by the House was accomplished with a substantial majority in favor of the bill.

The basic features of the Washington bill are: (a) the legal protection of the title "Certified Psychologist," (b) provision for establishment of an examining board of five persons, all of whom are psychologists, for determining eligibility of applicants, (c) definitions of crimes and provision of penalties, and (d) privileged communication.

From the background of experience in the State of Washington the following suggestions are offered:

1. Probably two years or more of planning, drafting, revision, and discussion should be anticipated before formal presentation of a bill to the legislature. No attempt should be made to push a bill through prematurely, that is, prior to the positive endorsement of a large majority of the state's psychologists. No state association is likely to be satisfied with ready-made bills, as already adopted by other states. The experience of other states may be of some value, but it is necessary for individual associations to work through the same problems for themselves before agreement can be reached. Psychologists seem no different from other groups in this respect.

2. It should be anticipated that a campaign for legislation will cost at least \$500, in addition to the cost of a lobbyist. Good organization and education prior to the convening of the legislature, with many psychologists contributing their time, will keep costs down, but probably not under this

<sup>1</sup> Others are Arkansas, Connecticut, Georgia, Kentucky, Maine, Minnesota, Tennessee, and Virginia.

<sup>2</sup> Gerty, F. J., M.D., Holloway, J. W. Jr., & Mackay, R. P., M.D. Licensure or certification of clinical psychologists. *J. Amer. Med. Assn.*, 1952, 148, 271-273.



estimate. In populous states with active opposition, expenses may be expected greatly to exceed \$500.

3. Competent legal service in the final stages of drafting will save time and possibly the bill itself.

4. Consultation with the Director of Licensing as to provisions of the bill is important.

5. Agreements and endorsements of the bill by organizations should be secured long before the legislature convenes. If strong opposition is to be expected, an advance line-up of supporters in all areas of the state will save time and anxiety. Obtain information on legislation proposed by other groups likely to oppose your own, as preparation for making decisions on what other bills psychologists can support.

6. Other conditions being equal, everyone knows that bills which are introduced early in the legislative session have a higher survival rate.

7. A skillful, experienced lobbyist is a very good investment. A bureau of psychologists should be selected in advance and be prepared to respond on call for discussions of the bill before various committees.

8. Individual legislators should be interviewed personally long before the legislature convenes, for the purpose of discussing the bill with them. Members of all committees which will be considering the bill should get special attention. Most legislators will have no original prejudice against a certification bill, and it is not difficult to get their support if it is accomplished early and at leisure. Washington legislators were found to be interested, and very cooperative, even during the pressure period of active sessions.

9. In our situation, the most effective general argument for certification proved to be the principle of public protection against quacks. The fact that some psychiatrists appreciate having an available list of certified psychologists in the state also

may be of advantage. In states where the number of psychologists eligible for certification is small, it is difficult to claim that legislation is of great benefit to the profession because, in fact, it is not.

10. Although conditions may change, present indications are that moves toward certification will provoke opposition from some medical groups, but unorganized opposition will be, to a great extent, the result of lack of understanding of objectives, and much of it can be dissipated. There is, of course, a difference in amount of opposition which will depend on the nature of the bill. Most certification bills will present fewer complex problems than most licensing bills.

11. Out of a score or more of specific objections raised against the Washington bill, we shall cite four which might be expected to crop up elsewhere.

*a.* Psychology is the only healing art without specified limitations. These should be defined before *any* legislation is adopted.

*b.* In effect, certification *means* licensing.

*c.* Medical certification boards are internal and not legal. Psychologists can operate in the same way.

*d.* The Medical Practices Act is much more effective as a means of controlling quacks than a certification bill for psychologists can ever be.

The answers to these objections, and many others of lesser weight, should be fairly obvious. Only the last one listed gave us much trouble. Perhaps our colleagues elsewhere can cope with it more effectively.

RUTH LEVY, *Chairman,*  
*Legislative Committee*

HELEN BOGARDUS

JAMES H. ELDER

AUDREY HOLLIDAY

LEONARD SCHNEIDER

## Comment

### A New Type of Test Answer Sheet

Three research psychologists in TAGO have developed a new system for marking separate answer sheets used with tests. The new system uses the letter of the item choice as the answer space to be marked by the examinee. The following is an example of this system applied to a four-choice item:

```

1 A B C D
2 A B C D
3 A B C D
4 A B C D

```

The outline of the letters occupy the same space as the registration markings on a standard answer sheet suitable for machine scoring. The examinee is instructed to blacken out the letter that goes with the answer he has chosen as being correct.

The system currently used requires the examinee first to find the letter of the alternative choice and then to mark in the spaces below that letter. An example follows.

```

      A B C D
1  :  :  :  :
      A B C D
2  :  :  :  :
      A B C D
3  :  :  :  :
      A B C D
4  :  :  :  :

```

The new system has been adopted officially for the new forms of the Armed Forces Qualification Test. The first use to be made of the new type of answer sheet is by applicants for enlistment and for induction—i.e., all persons taking the new AFQT. Approximately 1,220,000 such examinees were administered the current AFQT during 1953 and 1,000,000 during 1954.

The following benefits are seen:

1. The new system is designed to reduce errors made by examinees in marking the letter they choose for each item.
2. The new system is simpler. One step is eliminated in going from the item in the booklet (number and lettered alternative) to the answer sheet (number and letter—rather than number, letter, and space beneath letter).
3. One possible confusion is eliminated since A, B,

C, and D are more clearly identified as being on the same line with a given item number.

4. A not uncommon misunderstanding which leads the examinee to circle the letter over the dotted lines on an ordinary answer sheet, instead of marking between the lines under the letter, is eliminated. Such misunderstanding now requires test scorers to re-mark the papers before processing can begin.

5. Instructions on method of marking answers are simpler to state and easier to understand, thereby cutting down administration time. This is of particular importance for examinees who have had no prior experience with using answer sheets.

6. The new answer sheet presents a cleaner, less complicated-looking appearance.

7. The new system is easily applied to answer sheets including any number of alternatives; for example, for tests providing five possible choices for an item, the letters A, B, C, D and E would be used.

Reaction to the new answer sheet by technicians in the Army and in the other Services has been so universally favorable that its use will undoubtedly be extended to answer sheets for instruments other than AFQT.

MARY A. MORTON

WILLIAM G. HOYT

LAVERNE K. BURKE

Personnel Research Branch, TAGO,  
(8 March 1955)

### Follow-up of Undergraduate Majors in Psychology

The question of what happens to our undergraduates is important to the profession as a whole, and to each department of psychology. The dividends in improved instruction and guidance of current major students appear well worth the effort of periodic follow-up.

Under the direction of the undersigned, a survey of former psychology majors at the University of Hawaii was recently completed. The results were somewhat different from those reported in *The American Psychologist* in 1952 for New York University majors.<sup>1</sup>

The study of University of Hawaii psychology majors who were seniors between 1948 and 1953 was based on an analysis of 120 questionnaires (51% of mailing list). Major findings of the study were as follows:

1. From six months to five and a half years after leaving college, only three of the psychology graduates were employed directly in the field. The women most frequently had gone into social service occupations

<sup>1</sup> GUSTAV, ALICE. A follow-up of undergraduate psychology majors. *Amer. Psychologist*, 1952, 7, 510-512.

(teaching, social work) (36%) or homemaking (31%) while the men were more typically in non-social-service occupations (sales, clerical) (35%), still in school (21%), or in the armed forces (16%). (The follow-up by Gustav of New York University majors over a ten-year period showed that 44 per cent had taken graduate study in psychology and 36 per cent were employed as psychologists.)

2. Only a tenth reported graduate study in psychology. However, approximately half of the psychology majors (46%) had continued their educations in graduate or professional schools; in the case of the women, advanced study had led directly into related social service occupations.

3. Reported median yearly income for the half of the former students who were employed full time as civilians was \$3,400, for both men and women.

4. Approximately four out of five of these former students felt that a psychology major was of value in their jobs and personal development.

Thus the field of psychology at the University of Hawaii, unlike New York University, was rarely an entry into professional psychology, but for many former students it did lead into further study and eventual employment in related social service occupations.

The University of Hawaii is unique in its insular location, the socioeconomic context in which it operates, and the racial backgrounds of its student body. It is not unique, however, in the professional caliber of its faculty, or the general ability of its students, both of which compare favorably with other land grant colleges. I wonder how marked the differences in products are among other American psychology departments?

ARTHUR A. DOLE  
University of Hawaii

#### Concerning Nonconformity in the "Psychological Value Systems" of the Several Divisions of APA

As I read Thorndike's "The Psychological Value Systems of Psychologists" (*American Psychologist*, 1954, 9, 787-789), it occurred to me that he had presented data from which we might examine the degree of conformity of the "professional value structure"<sup>1</sup> of psychologists from the several divisions of APA.

In his Table 3 (p. 788), Thorndike reports the mean standard scores for a sample of Fellows from seventeen APA divisions on the nine "Psychologists' Values Scales" of an inventory which he developed "to appraise the professional value structure of psychologists." Since the scores are standardized on a sample of Fellows from APA ( $M = 50$ ,  $SD = 10$ ), the deviation from 50 of the mean score of a division on any value scale would ap-

<sup>1</sup> This and other quotes are from Thorndike's articles.

TABLE 1  
TWO MEASURES OF NONCONFORMITY IN PSYCHOLOGICAL  
VALUE STRUCTURES OF APA DIVISIONS

Division	Number of Scales on which Div. M was at least a half SD from total M	Mean Deviation of Div. M's from total M (Sign disregarded)
1. General	4	4.0
2. Teaching	3	2.1 C
3. Experimental	5 N-C*	5.4 N-C
5. Eval. and Measurement	4	5.2 N-C
7. Developmental	3	3.2
8. Pers. and Soc.	0 C**	.8 C
9. SPSSI	7 N-C	6.0 N-C
10. Esthetics	4	4.8
12. Clinical	3	3.3
13. Consulting	5 N-C	3.8
14. Indust. and Business	3	3.4
15. Educational	4	3.7
16. School	4	3.7
17. Counseling	1 C	1.8 C
18. Public Service	2	2.9
19. Military	0 C	2.8
20. Maturity and Old Age	2	3.1

\* N-C Nonconformists.

\*\* C Conformists.

pear to be a measure of the nonconformity of the division on the particular value dimension.

Two measures of the deviation of the divisional scores from the norm are reported in our Table I. Thorndike, in his Table 3, used boldface type to show divisional means which were as much as a half standard deviation from the total group mean. By simply counting the number of such means for each division, we have one measure of nonconformity. These are reported in the second column of Table 1. In the third column, the measure of nonconformity used was the mean deviation of the nine divisional means from the total mean (50), with signs disregarded. In both columns the three largest deviations are labeled N-C (nonconformists), and the three smallest C (conformists).

The two methods of measuring nonconformity are not in complete agreement, but the differences are slight. (The rank-difference correlation between the two is .93.) The measures agree in two of the three cases as to both the conformists and the nonconformists. The conformists are Divisions 8 (Pers. and Soc.) and 17 (Counseling); the nonconformists are Divisions 3 (Experimental) and 9 (SPSSI). Runners-up as conformists are Divisions 2 (Teaching) and 19 (Military), as nonconformists Divisions 5 (Meas. and Evaluation) and 13 (Consulting).

Professor Thorndike is to be congratulated. At long last we find a point of agreement between the experi-



mentalists and SPSSI. They both agree in disagreeing with their fellow psychologists!

On the serious side, the polar positions of these two groups (one valuing "carrying out a program of experimental investigation in the tradition of the physical and biological sciences;" the other giving priority to "global theorizing," "study of the individual," and "disseminating psychological knowledge") suggest the possibility that Thorndike may be dealing with differences in social value systems of which professional values are but a part.

As to an explanation of the conformists, the reader can do his own theorizing.

VERNER M. SIMS  
*University of Alabama*

### Let's Reduce Statistical Drudgery. III

Seeing a letter under this title in the October issue, I felt it might be of interest to give some details of what has been done here to reduce the drudgery of record reading and computation. We have developed a recording machine, the SETAR (1) (serial event timer and recorder), which is based on techniques used in electronic digital computers. The record is made on five-hole teleprinter tape, and can be used both to prepare a printed record and directly as an input tape to a computing machine.

The SETAR can be thought of as doing the same work as a polygraph with eight electromagnetically operated pens, some or all of which could be connected to the apparatus of the task being studied. In such a polygraph when a pen went on or off it would make a "blip" on the paper and the line drawn by the pen would change its position, from which one could see at any time whether it was on or off. If the paper were moving at a constant speed the record could be read by measuring the distance between "blips," either from the same pen or different ones, and translating this into a time interval. In the SETAR whenever any one of its eight input circuits (equivalent to a pen) is operated, a pattern of holes is punched in the teleprinter tape. This gives an indication of which input was operated and the state—whether on or off—of the other seven. Together with this is a three-digit number which gives directly the time in hundredths of a second (or any longer unit desired) which has elapsed since the last input.

The punched record can be read by eye, and with a little practice it is much quicker and more accurate than extracting the same information from polygraph records. Normally we translate the punched tape by means of a standard teleprinter reader and a slightly modified printer. This gives a record on narrow gummed paper strip, comprising three digits for the time interval, and two letters indicating the state of

the eight input circuits. This is very easy to read, as the letters can be thought of as referring directly to operations in the subject's task. We have found that having the record on gummed strip is convenient since it can be cut into pieces and assembled on sheets of paper in tabular form, without the labor and possible errors of manual transcription. If further tables are required, it is simple to make additional copies of the record. It would also be possible to make a tabulating printer with little addition to standard teleprinter equipment.

The labor saving has been carried a stage further by making use of the electronic computer in the Cambridge Mathematical Laboratory (EDSAC). For this the writer has prepared a general purpose program which sorts the data into a number of categories, and for each category gives the number of observations, the sum, the sum of squares, the mean, and the variance.

The SETAR has been in use in this laboratory during the past four years, for recording from a number of different experiments. Although in many cases simpler recording apparatus, such as a bank of cumulative counters, could have been used, we feel that the use of this rather more complex system has been well worth while. By taking a detailed record in the first instance, it is often possible to answer questions which are only apparent after the initial analysis, by referring back to the original data. If simpler methods of recording had been used it would probably have been necessary to repeat the experiment with all that this entails in waste of time and money, and in difficulty of finding subjects.

The SETAR has been loaned for studying a number of factory operations, and in this field it represents a considerable economy in those cases where it can be used instead of cinephotography. An improved model has been built here and copies made by the Department of Engineering Production, Birmingham University, and the National Institute of Industrial Psychology. The main field of application has so far been in that of motor skills, but the SETAR is essentially flexible enough to be used in a wider sphere. The scope may be extended to other than time measurements, e.g., the sampling of one or more continuous variables, by the use of additional special units. The initial outlay is admittedly somewhat high, perhaps £650 (\$1,850) for the machine and £250 (\$700) for the printing translator, but as the running costs are almost negligible, the expense would be quickly recovered in terms of time saved. These costs would be lower if the machine were built in the laboratory, and use made of surplus components.

NORMAN T. WELFORD  
*Cambridge University*

### REFERENCE

1. *J. Sci. Instrum.*, 1952, 29, 1-4.

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## Psychological Notes and News

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**Genevieve Chase**, New York City, died October 10, 1954.

**Sir Godfrey Thomson**, professor emeritus at the University of Edinburgh, died on February 9, 1955, after a short illness.

**Frank R. Clarke** died on February 15, 1955.

**Mary H. Weislogel**, of the American Institute for Research, died on June 8, 1955.

**George W. Hartmann**, head of the psychology department at Roosevelt University, died June 11, 1955.

**Egon Brunswik**, professor of psychology at the University of California, Berkeley, died on July 6, 1955.

**Helge O. Lundholm**, of Duke University, died on July 8, 1955.

**Lloyd N. Yepsen**, New Lisbon, New Jersey, died on August 1, 1955.

**William F. Lutz**, Riviera Beach, Florida, died on August 17, 1954.

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**Harry F. Harlow** of the department of psychology at the University of Wisconsin has been named to the first George Cary Comstock research professorship. The appointment is for a five-year period. **Frederick A. Mote** succeeds him as chairman of the department. **Leonard Berkowitz**, formerly with the Research and Development Group, Randolph Air Force Base, has been appointed assistant professor of psychology in the area of social psychology.

**Launor F. Carter**, formerly of the Human Resources Research Office at Fort Ord, is now with the RAND Corporation in Santa Monica, California.

**James G. Miller** has become professor and chief of the Mental Health Research Institute at the University of Michigan. The Institute is a new interdisciplinary organization for the development of general behavior theory and for basic theory-oriented biological and social empirical research in behavior.

**S. D. S. Spragg**, professor of psychology at the University of Rochester, has been appointed a Fulbright lecturer in experimental psychology and human engineering at the Technische Universitaet in Berlin-Charlottenburg for the academic year 1955-1956.

**Georg v. Békésy** of the Psycho-Acoustic Laboratory, Harvard University, has been awarded the degree of Doctor medicinae honoris causa by the Faculty of Medicine of the University of Münster in Westphalia. At special ceremonies at Münster he was cited for his contributions to the physiology of the ear which have advanced the theory and the practice of otology.

At the department of psychology of the **American University of Beirut**, Lebanon, **Wayne Dennis** will be visiting professor for the academic year 1955-1956. The department recently had a one-week summer seminar for English-speaking psychologists in the area (Lebanon, Syria, Jordan, Iraq). **Nevitt Sanford** conducted the discussions on "Persistent Problems in Personality." Full-time members of the department include **E. T. Prothro** (chairman), **L. H. Melikian**, **J. A. Jensen**, **J. D. Keehn**, and **Mrs. S. Katul**. Part-time members include **P. Najarian** and **H. Kurani**.

At the **University of Oklahoma** an Institute of Group Relations has been established with **Muzafer Sherif** as director. **M. O. Wilson** has retired as chairman of the psychology department September 1, but will continue as professor of psychology. **Carl R. Oldroyd** succeeds him as chairman. **Irene Mackintosh** has been added to the staff as assistant professor. **L. B. Hoisington**, professor emeritus, is continuing his research work, writing, and some of his teaching. **Robert S. Wilson**, assistant director of the Psychological Service Center, has been added to the staff as special instructor. **Alfred F. Glixman** was appointed to the staff last year as associate professor.

**Ross Stagner** will be spending the next academic year at the University of Rome on a Fulbright grant. He will be on sabbatical leave from the University of Illinois and will be engaged in personality studies of union and management leaders

in Italy to continue a comparative study already begun in this country.

**Scarvia B. Anderson**, Naval Research Laboratory, has received a Fulbright award for study at the Institute of Experimental Psychology, University of Oxford, for the academic year 1955-1956. While there, she will be engaged in research on problem solving, under the direction of George Humphrey.

**Robert Jacobs**, formerly educational measurements adviser in the education program of the United States Foreign Operations Mission to Ethiopia, has been promoted to the position of deputy chief of the cooperative education program in Ethiopia. This program is part of the technical assistance program with headquarters in Addis Ababa, Ethiopia.

**The Military Operations Research Engineering Division** of Lockheed Aircraft Corporation, Marietta, Georgia, announces the addition of three psychologists to its human engineering group: Kenneth S. Teel, former director of training, Perceptual Development Laboratory, St. Louis, Missouri; Robert C. Smader, formerly of the University of Wisconsin; and Oscar S. Adams, former assistant professor of psychology, Emory University, Atlanta, Georgia. William Bevan, associate professor of psychology, Emory University, is with the group on a part-time basis. The group is under the direction of Jack A. Kraft.

**Robert A. Schaef** has been appointed chief psychologist for the Columbus Psychiatric Clinic. Two new staff members have also been appointed: Vincent F. O'Connell and J. Milan Kolarik.

**Robert H. Alexander**, formerly chief area psychologist for the Illinois Department of Public Instruction, is now associate professor of psychology at MacMurray College, Jacksonville, Illinois.

**William J. Reiss** has joined the staff of the Hillsborough County Guidance Center in Tampa, Florida.

**David H. Jenkins** has been appointed associate professor of education and director of the Temple Group Dynamics Center in Teachers College, Temple University, Philadelphia. He was formerly editor of *Adult Leadership*, published by the Adult Education Association.

**Social Research, Inc.**, Chicago, announces that Harriett Bruce Moore is now associate director for research, and Sidney J. Levy is now director of psychological research. Lee Rainwater will head a newly created department as director of special studies.

**Margaret Schulze Jessen** is now in charge of psychological services for the Woodland, California, Public Schools. She was for five years on the staff of the department of psychology of San Francisco State College.

**William J. Shimon** is now assistant principal of Yonkers High School, Yonkers, New York.

**Arnold Bernstein**, instructor of psychology at Queens College, Flushing, New York, has joined the staff of the Neuropsychiatric Clinic, of the New York Polyclinic Medical School and Hospital as a staff psychologist.

**William B. Coate** has accepted an appointment as assistant professor of psychology at Wellesley College.

**Theodore Millon** has recently been appointed to, and elected president of, the Board of Trustees of the Allentown State Hospital, Allentown, Pennsylvania. Plans have been initiated under the new hospital administration to expand the staff of the psychology department to nine full-time members and five full and rotating internships. Dr. Millon is currently assistant professor of psychology at Lehigh University.

**Edward Glaser & Associates** announce the addition of Oliver H. Bown in Austin as a part-time associate. Dr. Bown is director of the counseling division, testing and guidance bureau, University of Texas, Austin, Texas.

**Wendell E. Jeffrey**, formerly of Barnard College, Columbia University, is now assistant professor of psychology at the University of California, Los Angeles.

**Cecil Wurster**, formerly with the Air Force Personnel and Training Research Center is now chief, division of research, Louisiana Department of Institutions. Bernard M. Bass of Louisiana State University is consultant to the division. Other members of the staff include Delaney A. Dobbins, Howard Bryant, and Jack Hain, research statis-



ticians, and Riviere Morris, supervisor, tabulating equipment section. The division is responsible for analyses of patients, personnel, and operating effectiveness of the general, mental, and tuberculosis hospitals, correctional institutions and guidance centers operated by the Department of Institutions. The division will also aid in evaluating the efficacy of drug therapies under a special legislative appropriation of \$513,000 and in facilitating "essential research in mental health" under another legislative grant of \$100,000 for the current fiscal year.

**William Sloan**, supervising psychologist at the Lincoln State School, has resigned to accept a position as director of psychological services at the State Colony and Training School, Pineville, Louisiana.

**Philip Ash** has been appointed assistant manager of the industrial relations department of the Inland Steel Company at its Chicago headquarters.

**McMurry, Hamstra & Company** have announced the addition of Douglas M. More to their Chicago office, James F. Carey to their San Francisco office, and Edward L. Hearsey to their Los Angeles office.

**Alastair Heron**, who visited many American departments last summer, has been appointed full-time deputy director of the new Group for Research on Occupational Aspects of Ageing which the British Medical Research Council is establishing on October 1, 1955. This new group will be attached to the department of psychology at the University of Liverpool, with L. S. Hearnshaw, professor of psychology, as Honorary Director. Dr. Heron has been for six years a member of the Council's scientific staff, attached to the Unit for Research on Occupational Adaptation.

**Alfred E. Goldman**, formerly assistant professor in psychology at Northeastern University, has been appointed research associate in the School of Public Health, Harvard University. He will serve as research psychologist in the Pilot Study in Rehabilitation, a research program sponsored by the National Institute of Mental Health, at the Boston State Hospital.

**Francis C. Walker** has joined the staff of Byron Harless and Associates, Tampa, Florida, as an industrial psychologist. He was formerly employed as a personnel counselor with Caterpillar Tractor Company, Peoria, Illinois.

**Harry A. Grace** has been appointed dean of men and associate professor of psychology at Grinnell College, Grinnell, Iowa.

The psychology department at **Trenton State Hospital** announces the following staff changes: Herman Spitz has been promoted to the position of senior psychologist and Sheldon Kopp has been appointed as assistant psychologist. Richard Siss and Edith Fingert are the new interns. Virginia Erdman is the psychological trainee.

**Gregory A. Miller**, formerly chief psychologist of the Michigan State Department of Corrections, has been appointed to the staff of the College of Education, Michigan State University. He will be responsible for coordinating the program in rehabilitation counseling.

**William, Lynde & Williams** announce the addition of Tolan L. Chappell to their staff, to be in charge of West Coast operations.

The psychology department at the **Woodville State Hospital** now has the following staff: Ralph E. Davis, senior psychologist; Joseph W. Bansavage, Judith Bansavage, Elmer Match, clinical psychologists.

**Carl H. Elliott** has accepted a position as manager of industrial relations of the Socony-Mobil Oil Refinery at Hammond, Indiana.

**Science Research Associates** announces the appointment of Leroy Wolins as a member of SRA's test research department.

**Arthur Mann**, assistant vocational director of the Osborne Association, has received a part-time appointment to the staff of Brooklyn College. He will teach in the School of General Studies in classes composed mainly of police staff.

**Philip I. Sperling** has returned from his duties as Department of the Air Force civilian in Paris, France, and Wiesbaden, Germany, and has been assigned to the Headquarters, Air Force Personnel and Training Research Center, at Lackland Air Force Base, San Antonio, Tex. He will be concerned with the Air Force research program for the estimation of qualitative personnel requirements of new weapon systems.

**Robert R. Benson** is now clinical psychologist at the Child Study Institute, Family Court Center, Toledo, Ohio.

**Melvin B. Drucker**, graduate student at George Peabody College, and **Wallace A. Kennedy**, graduate student at Florida State University, have reported for a year's internship with the South Carolina Mental Health Commission. They will work with Carl A. Bramlette, Jr., and Dale S. Higbee in the South Carolina State Hospital, Martha R. Westrope in the Richland County Mental Health Clinic, and George Soloyanis in the office of community services.

**Gordon Hearn**, associate professor of social welfare, University of California, has been appointed the Harry M. Cassidy Visiting Research Professor at the University of Toronto for 1955-1956.

The following former students in **The Army Senior Psychology Student Program** completed their PhD degrees at the universities indicated during the past year: C. A. Thomas, Jr., Pennsylvania; J. R. Smith, California; S. R. Hyman, Pittsburgh; R. Sandison, Harvard; J. H. Scott, Illinois; A. G. Parker, California; R. W. Roberts, California; P. Oderberg, California; H. A. Hiemar, Cornell; E. J. Murray, Yale; L. F. Salzman, Rochester; A. R. Mahrer, Ohio State; D. W. Rodgin, Purdue; and J. L. Fletcher, Kentucky.

The psychology staff at **Northern State Hospital**, Sedro-Woolley, Washington, now includes E. Frederick Thompson and James R. Jeffers. Both men were formerly employed by the Colorado State Hospital at Pueblo, Colorado.

**Joel T. Campbell** has been appointed associate director of the Psychological Research Services of Western Reserve University. This position was formerly held by Erwin K. Taylor.

**Erwin K. Taylor** announces the organization of the Personnel Research and Development Corporation, Cleveland, Ohio. President of this new corporation is Erwin K. Taylor who will be joined by Edwin C. Nevis, formerly of Worthington Associates, and Richard S. Barrett.

**Nathaniel R. Kidder** has resigned from his position as manager of the market research and sales analysis division of the Jones & Lamson Machine Company, Springfield, Vermont, to accept a position as vice president and director of marketing of the engineering consulting firm, Technical Marketing Associates, Inc., Concord, Massachusetts.

**Yale University** announces that Seth K. Sharpless of McGill University has accepted appointment as assistant professor, and Tom N. Cornsweet of Brown University has accepted an instructorship.

**Peter Dubno** has joined the staff of the vocational consulting and testing division of Polytechnic Institute of Brooklyn as industrial consultant.

**Joseph C. Heston** has accepted appointment as professor of psychology at Albion College, Albion, Michigan.

**Roger G. Stewart** has been assistant psychologist in the Institute of Transportation and Traffic Engineering, University of California, Los Angeles, since January 1954. He is engaged in research studies of driving attitudes.

**Wayne H. Holtzman**, associate professor of psychology at the University of Texas has been appointed associate director of the University of Texas Hogg Foundation for Mental Hygiene.

**Paul M. Fitts** has succeeded Frank A. Geldard as chairman of the Advisory Panel on Personnel and Training Research in the Office of the Assistant Secretary of Defense (Research and Development). The Advisory Panel operates largely through a Steering Group which organizes Working Groups of Panel members for special problems. Steering Group members are Paul M. Fitts, chairman; George K. Bennett, Leonard Carmichael, Neal E. Miller, Harry F. Harlow, S. S. Stevens, Frank A. Geldard, and Aaron B. Nadel, secretary.

**Zygmunt Piotrowski**, research psychologist for the New Jersey Department of Institutions and Agencies in the research division in psychiatry and neurology, has been added to the list of consulting editors for the *Psychological Newsletter*.

The department of psychology of **United Cerebral Palsy Clinic** of Miami now consists of Marjorie Collins, chief psychologist; Louis Maradie, psychologist. Robert M. Allen, University of Miami, is the psychology consultant. The University of Miami and the United Cerebral Palsy Association of Miami will sponsor a Second Workshop in Cerebral Palsy (clinic-wide) to be held on October 28 and 29 at the Kouebec Center of the University of Miami. Psychologists are invited to attend this Workshop.

**Howard S. Rome**, formerly with the Child Guidance Clinic, New York State Department of Mental Hygiene, is now with the AFES Mental Testing Section, Military Personnel Procurement Group, St. Louis, Missouri.

**Leonard Blank** has recently begun a postdoctoral traineeship with the Veterans Administration in San Francisco (Fort Miley Hospital), sponsored by Stanford University.

**Irwin J. Schultz**, formerly counseling psychologist with the VA Hospital, Downey, Illinois, is now vice-president of the Golden Triangle Toy Manufacturing Co., Pittsburgh, Pennsylvania, where he will be responsible for plant operations and personnel functions.

**Forrest E. Ladd** has been appointed assistant professor of psychology at Bethany Nazarene College, Bethany, Oklahoma. **C. Harold Ripper** is chairman of the department.

**Evansville (Indiana) State Hospital** announces the appointment of **Robert W. Bauer** as chief psychologist and **Spiro B. Mitsos** as assistant chief psychologist. **L. Max Baird** remains on the staff, and **Leonard W. Allen** has resigned to resume study at the University of Denver.

**Harry Waller Daniels** has been appointed associate professor of psychology at Southern Illinois University, Carbondale, Illinois.

**Bernard Kutner**, formerly director of studies in gerontology, Cornell University Medical College, has been appointed assistant professor of preventive and environmental medicine (social science), Albert Einstein College of Medicine, Yeshiva University, under a grant from the Russell Sage Foundation.

**Samuel W. Gluskin** and **Samuel M. Seltzer** have been permanently appointed to the positions of clinical psychologist in the Department of Mental Hygiene, Attica State Prison, Attica, New York.

**Jack Matthews** is now professor and head of the department of speech at the University of Pittsburgh. He will also continue as director of the speech clinic.

**Norman Polansky** has been appointed associate professor of social work in the School of Applied Social Sciences at Western Reserve University.

**Robert F. Corder** is joining the staff of the University of Richmond; **William R. Reevey** has accepted a position with DePaul University; and **Edwin S. Zolik** is joining the faculty of the University of Portland. All were formerly with the School of Clinical and Applied Psychology of the Richmond Professional Institute.

**Harry B. Gilbert** has been appointed a member of the Board of Examiners, Board of Education, City of New York. His previous position was supervisor of psychologists in the Bureau of Child Guidance.

**Franklin P. Kilpatrick** has been appointed head of research development of National Analysts, Inc.

**Joseph V. Hanna** was recently cited for his twenty-five years of service as professional secretary of the Vocational Service Center of the YMCA of New York City, and for his administration and development of professional counseling services, training of students, and counseling of thousands of young men and women.

**J. E. Wallace Wallin** has received the 1955 Meritorious Service Award from Augustana College. During the past year Dr. Wallin established two annual awards for students of distinction in clinical psychology, special education, and mental hygiene, one award to be administered by Upsala College and one by Augustana College. In alternate years the award at Augustana will provide funds for the J. E. Wallace Wallin Lectureship.

#### VA DEPARTMENT OF MEDICINE AND SURGERY ANNOUNCEMENTS

##### *Clinical Psychology Division*

**Walter W. Amster** has been appointed to the staff of VA Hospital, New York, New York.

**William T. Appell**, formerly of the staff of Presbyterian Hospital, New York City, has been appointed to the staff of VA Hospital, Chillicothe, Ohio.

**Josephine Ball**, formerly of the staff of New York State Department of Mental Hygiene, has been appointed to the staff of VA Hospital, Perry Point, Maryland.

**Robert W. Bauer** has resigned from the staff of VA Hospital, Sheridan, Wyoming.



**Harriet J. Bentley** has resigned from the position of Chief Clinical Psychologist, VA Regional Office, Cincinnati, Ohio.

**Henry J. Bessette**, a graduate of the VA Training Program, Purdue University, has been appointed to the staff of VA Hospital, Marion, Indiana.

**Roy E. Buehler** has been designated Chief, Psychology Training Unit, VA Hospital, Perry Point, Maryland.

**James J. Calvert** has transferred from the staff of VA Hospital, Roanoke, Virginia, to the position of Chief Clinical Psychologist, VA Hospital, Albuquerque, New Mexico.

**Philip M. Carman**, a graduate of the VA Training Program, University of Washington, Seattle, Washington, has been appointed to the staff of VA Hospital, Roseburg, Oregon.

**Murray L. Cohen**, a graduate of the VA Training Program, Boston University, has been appointed to the staff of VA Hospital, Brockton, Massachusetts.

**S. Thomas Cummings** has resigned from the position of Chief Clinical Psychologist, VA Hospital, Pittsburgh, Pennsylvania, to accept a position as assistant professor, University of Chicago Medical School.

**John E. Davis, Jr.**, a graduate of the VA Training Program, University of Kentucky, has been appointed to the staff of VA Hospital, Lexington, Kentucky.

**John H. Flavell** has resigned from the staff of VA Hospital, Ft. Lyon, Colorado, to accept a faculty position at the University of Rochester.

**Ernestine D. Freud** has been appointed to the staff of VA Regional Office, Newark, New Jersey.

**F. Harold Giedt** has transferred from the staff of VA Hospital, Perry Point, Maryland, to VA Hospital, Sepulveda, California.

**Vincent Glaudin** has transferred from the staff of VA Hospital, Portland, Oregon, to VA Hospital, American Lake, Washington.

**Irving M. Goldstein**, a graduate of the VA Training Program, University of California, has been appointed to the staff of VA Hospital, Sepulveda, California.

**Irvin Greenberg**, a graduate of the VA Training Program, University of Pennsylvania, has been appointed to the staff of VA Regional Office, Baltimore, Maryland.

**Robert W. Harrington** has resigned from the staff of VA Hospital, Marion, Indiana.

**Clarence H. Hartman**, a graduate of the VA Training Program, University of Iowa, has been appointed to the staff of VA Hospital, Knoxville, Iowa.

**Philip Himmelstein**, formerly on the staff of the University of Texas, has been appointed to the staff of VA Hospital, Roanoke, Virginia.

**Thomas W. Kennelly**, Chief, Psychology Training Unit, VA Hospital, Perry Point, Maryland, has transferred to the position Chief, Psychology Training Unit, VA Hospital, Palo Alto, California.

**Joe L. Lawson, Jr.**, has transferred from the staff of VA Hospital, Louisville, Kentucky, to the position of Chief Clinical Psychologist, VA Hospital, Alexandria, Louisiana.

**Eric W. Layne** has transferred from the staff of VA Hospital, Tuskegee, Alabama, to the staff of VA Hospital, Lyons, New Jersey.

**Edward Lovinger** has resigned from the staff of VA Hospital, Battle Creek, Michigan.

**Vernon K. Lum** has transferred from the staff of VA Hospital, Knoxville, Iowa, to the position of Chief Clinical Psychologist, VA Hospital, Saginaw, Michigan.

**Gildas E. Metour** has transferred from the position of Chief Clinical Psychologist, Tucson, Arizona, to the staff of VA Hospital, Sepulveda, California.

**Richard G. Murney** has transferred from the staff of VA Hospital, Topeka, Kansas, to VA Hospital, Ft. Lyon, Colorado.

**Joseph Newman** has transferred from the staff of VA Hospital, Memphis, Tennessee, to the position of Chief Clinical Psychologist, VA Hospital, University Drive, Pittsburgh, Pennsylvania.

**Dale H. Ortmeier**, a graduate of the VA Training Program, Teachers College, has been appointed to the staff of VA Regional Office, New York, New York.

**Leonard Oseas** has been designated Chief Clinical Psychologist, VA Regional Office, Cincinnati, Ohio.

**Myrtle E. Pignatelli** has resigned from the staff of VA Regional Office, New York, New York.

**Homer B. C. Reed, Jr.**, a graduate of the VA Training Program, Purdue University, has been appointed to the staff of VA Hospital, Chillicothe, Ohio.

**Morris Roseman** has transferred from the staff of VA Hospital, Roanoke, Virginia, to the position of Chief Clinical Psychologist, VA Regional Office, Baltimore, Maryland.

**Eli A. Rubinstein** has transferred from the staff of the Washington Mental Hygiene Clinic to the position of Assistant Chief, Neuropsychiatric Research Unit, Veterans Benefits Office, Washington, D. C.

**John A. Salazar** has resigned from the position of Chief Clinical Psychologist, VA Hospital, Albuquerque, New Mexico.

**Donald P. Schmidt** has resigned from the staff of VA Hospital, Coatesville, Pennsylvania, to accept a faculty appointment at the University of Tennessee.

**Leroy Shropshire**, a graduate of the VA Training Program, Syracuse University, has been appointed to the staff of VA Regional Office, Syracuse, New York.

**Philip A. Smith**, a graduate of the VA Training Program, University of Kentucky, has been appointed to the staff of VA Hospital, Ann Arbor, Michigan.

**Patrick L. Sullivan** has resigned from the position of Chief Clinical Psychologist, Oakland Mental Hygiene Clinic, San Francisco Regional Office, to accept a faculty position at San Francisco State College.

**Norman Tallent** has been designated Chief Clinical Psychologist, VA Center, Kecoughtan, Virginia.

**Clare W. Thompson** has transferred from the position of Chief, Psychology Training Unit, Palo Alto, California, to the position of Chief Clinical Psychologist, Oakland Mental Hygiene Clinic, San Francisco, Regional Office.

**Frederick J. Todd** has transferred from the staff of VA Hospital, Topeka, Kansas, to the staff of VA Hospital, Denver, Colorado Mental Hygiene Clinic.

**Esther C. Toms**, a graduate of the VA Training Program, University of Minnesota, has been appointed to the staff of VA Hospital, St. Cloud, Minnesota.

**Herbert Turkel**, a graduate of the VA Training Program, New York University, has been appointed to the staff of VA Hospital, Montrose, New York.

**Milton Wilner**, a graduate of the VA Training Program, New York University, has been appointed to the staff of VA Hospital, New York, New York.

**Benjamin Winsten** has resigned from the position of Chief Clinical Psychologist, VA Center, Kecoughtan, Virginia.

#### *Vocational Counseling*

**Bartley E. Bess, Jr.**, has transferred from VA Center, Wadsworth, Kansas, to VA Hospital, North Little Rock, Arkansas, as Chief, Vocational Counseling Service.

**Leon Cohen**, formerly on the staff of VA Hospital, Northport, L. I., N. Y., has been appointed Acting Chief Vocational Counseling Service at that hospital.

**Cecil R. Forster** has completed his doctoral training at New York University, and has been promoted to Chief, Vocational Counseling Service, VA Hospital, Brooklyn, N. Y.

**George W. Franklin** has completed his doctoral training at Purdue University, and has been appointed as Chief, Vocational Counseling Service, VAH, Tuskegee, Alabama.

**John B. Geers** has completed his doctoral training at University of Missouri, and has been appointed Chief, Vocational Counseling Service, VA Hospital, Dallas, Texas.

**Kennon F. McCormick**, assistant professor, department of psychology, university of Maryland, has accepted a position with VAH, Lexington, Kentucky, as Chief, Vocational Counseling Service.

**Morse Manson** has transferred from VAH, Long Beach, California to VAH, Sepulveda, California, as Chief, Vocational Counseling Service.

**Stanley D. Needelman** has transferred from VAH, Northport, New York, to VAH, Manhattan, New York, as Chief, Vocational Counseling Service.

**Milton Turbiner**, trainee in the VA Vocational Counseling Training Program at Boston University, has accepted a position on the staff at VA Hospital, Northport, L. I., New York.

**William E. Walton** has accepted a position with the VA Hospital, Long Beach, California, as Chief, Vocational Counseling Service. Dr. Walton was formerly with the Air Force at Keesler Air Force Base, Mississippi.

The American Board of Examiners in Professional Psychology, Inc., conducted oral examinations at New York City, Chicago, Minneapolis, and Los Angeles, during the spring and early summer of 1955.

The total oral examination included a Professional Field Situation and the following four parts:

1. Diagnosis or evaluation (The definition of the problem faced by the professional psychologist)

2. Therapy and/or recommendations (How to deal with the professional problem)
3. Skill in the interpretation and use of research findings (What valid knowledge exists about the problems faced. How valid knowledge is obtained)
4. Organization and administrative problems of professional psychology (What are the conditions of acceptable professional practice)

The Board wishes to express its appreciation to the following Diplomates who served as members of its oral examining teams for the above mentioned examinations: Theodora M. Abel, Frances S. Alexander, Jessie J. Alozery, Benjamin Balinsky, Irwin A. Berg, William C. Biel, Roy Brener, Fred Brown, James F. T. Bugental, Hubert S. Coffey, Roy M. Dorcus, Lewis E. Drake, Jon Eisenon, Thomas N. Ewing, Miriam Faries, Herman Feifel, Ben C. Finney, Jerome Fisher, Frank M. Fletcher, Bertram R. Forer, Erika Fromm, Sol L. Garfield, Ann M. Garner, Harry B. Gilbert, William M. Gilbert, Edward M. Glaser, May S. Gowan, Mary E. Grier, J. P. Guilford, Milton E. Hahn, Ralph W. Heine, Max Hertzman, Howard F. Hunt, Clifford E. Jurgensen, Goldie R. Kaback, Seymour G. Klebanoff, D. B. Klein, Judith I. Krugman, Mary S. Kunst, Samuel B. Kutash, Donald B. Lindsley, Ida Linnick, Bernard Locke, Morse P. Manson, Kathern M. McKinnon, Harry V. McNeill, James G. Miller, Robert S. Morrow, Donald G. Paterson, Alma A. Paulsen, Samuel Pearlman, Frances C. Perce, Z. A. Piotrowski, Evelyn Raskin, Jessie Rhulman, A. R. Root, Alan K. Rosenwald, Audrey S. Schumacher, Emanuel K. Schwartz, Georgene H. Seward, William Sloan, Edward I. Strongin, Keith Sward, Percival M. Symonds, Read D. Tuddenham, Ruth Valentine, Neil D. Warren, Robert I. Watson, Herman R. Weiss, Alexander G. Wesman, Walter H. Wilke, Phyllis Wittman-Huffman, George Yacorzynski, Bohdan Zawadski, Joseph Zubin.

Also the Board wishes to recognize and to express its appreciation to the following former members of the Board who served as examiners or as chairmen of examining teams: Marion A. Bills, John G. Darley, Jean W. Macfarlane, Ruth S. Tolman, and David Wechsler.

A reorganization of territorial psychological services was recently effected in Hawaii. The research and training functions of the Psychological and Psychopathic Clinic have been amalgamated with the department of psychology of the University of Hawaii, and service functions with the Bureau of Mental Hygiene of the Board of Health.

The Hawaii Psychological Association has elected the following officers for 1955-1956: Herbert B. Weaver, president; John M. Digman, president-elect; Phyllis Coff, secretary-treasurer; Thayne M. Livesay, delegate to Conference of State Psychological Associations.

Officers of the Kansas Psychological Association for the coming year are: Anthony Smith, president; Arthur Brayfield, president-elect; Audell Herndon, secretary-treasurer; Homer Reed, delegate to the Conference of State Psychological Associations; Joseph Brewer, Council member-at-large.

The Maryland Psychological Association has elected the following officers for 1955-1956: Charles N. Cofer, president; Edward W. Slockbower, president-elect for 1956-1957; Betty Whitenack, secretary; Annalies A. Rose, treasurer; Roger K. Williams, member of Executive Council; Solomon Shapiro, chairman of Membership Committee; Irvin Greenberg, chairman of Ethics Committee; Lester M. Libo, chairman of Nominations Committee; Sherman Ross, chairman of Program Committee.

The New Jersey Psychological Association has the following officers for 1955-1956: Louis Delman, president; Merrill T. Hollinshead, first vice-president; Frederick J. Gaudet, executive secretary; Mildred Treverton, secretary-treasurer.

The North Dakota Psychological Association held its spring meeting on May 20-21 at the University of North Dakota. Officers elected for 1955-1956 were: William F. Bublitz, president; Ernest V. Estensen, president-elect; Mildred J. Treumann, secretary; W. Lynn Smith, treasurer; Hermann F. Buegel, conference delegate; Ruth J. Tasch; member-at-large of Executive Committee. Since its organization a year ago, the Association has expanded to include approximately 50 psychologically trained professional workers in the state.

The Wisconsin Psychological Association has the following officers for 1955-1956: Horace A. Page, president; William F. Fey, vice-president; Rudolf Mathias, corresponding secretary; Asher Pacht, treasurer; Dale Dysinger, recording secretary; Fred Y. Billingslea, ex officio member of the Council. Delegates to the Conference of State Psychological Associations are Rudolf Mathias and Ralph Tindall (alternate).



The **Brooklyn Psychological Association** has elected the following to the Board of Directors for 1955-1956: Benjamin Balinsky, president; Herman R. Weiss, vice-president; Rochelle M. Wexler, secretary; Stanley I. Gochman, treasurer; Leonard Bernstein, chairman, Community Relations Committee; Harold M. Proshansky, chairman, Employment Committee; Jacob I. Hartstein, chairman, Committee on Civic and Legislative Action; Elias N. Abrams, chairman, Membership Committee; Catherine A. Burnham, chairman, Committee on Professional Ethics; and H. A. Witkin, ex officio, former president.

The **Southern California Psychological Association** has elected the following officers: James F. T. Bugental, president; J. A. Morris Kimber, vice-president; Harry M. Grayson, secretary-treasurer. Other members of the Board of Directors continuing for the current year are Edward M. Glaser, D. B. Klein, William A. Thomson, and Zelda Wolpe. Georgine H. Seward was named to the Board of Directors as was Donald B. Lindsley.

A group of twenty-two psychologists in Long Beach, California, have formed a local organization and now are in their second year of existence. The members come from the school services, the State College, the VA hospital, industry, and private practice. The officers of the **Long Beach Psychological Association** are: Richard Laux, president; Charles Mason, vice-president; Amalie Phelan, secretary-treasurer.

The next meeting of the **School Psychologists of Upstate New York** is scheduled for Saturday, November 12, at the Corinthian Club in Syracuse. Qualified school psychologists interested in becoming members should apply to Mr. Edward R. McCann, Chairman of the Membership Committee, 96 Rosary Avenue, Lackawanna 18, New York.

The third **Inter-American Congress of Psychology** will be held in Austin, Texas, December 16-21, under the auspices of the Inter-American Society of Psychology. The central theme of the Congress will be the psychology of social tensions from an interdisciplinary point of view: namely, that of mental hygiene, social anthropology, education, and psychology. A special symposium will be organized for each topic. The University of Texas and the Hogg Foundation for Mental Hygiene will serve as hosts to delegates. Suggestions for reports

pertaining to the central theme of the Congress should be sent in quintuplicate to the Program Committee in care of the Secretary-General, Werner Wolff, Bard College, Annandale-on-Hudson, New York. Further information on the Congress may be obtained from the same office.

The **American Psychosomatic Society** will hold its Thirteenth Annual Meeting at the Sheraton Plaza Hotel in Boston on March 24 and 25, 1956. The Program Committee would like to receive titles and abstracts of papers for consideration for the program no later than December 1, 1955. The time allotted for the presentation of each paper will be twenty minutes. Abstracts should be submitted in sextuplicate, for the Program Committee's consideration, to Stanley Cobb, Chairman, 551 Madison Avenue, New York 22, New York.

The **Eastern Group Psychotherapy Association** will hold its next meeting at the New York Academy of Sciences on October 1. The business meeting will start at 8 P.M., the professional meeting at 9. Subject for discussion is "The Patient as a Therapist," and the speakers are Hugh Mullan and Edrita Fried.

The **38th Annual Occupational Therapy Convention** will be held in San Francisco, California, October 22-28, at the Sheraton Palace Hotel. The theme of the convention is "Bridges to the Future." Preceding the convention there will be a Workshop Institute (October 22-25) highlighting "The Patient's Point of View." Further program and convention information may be obtained from Northern California Occupational Therapy Association, 1680 Mission Street, San Francisco, California.

A **Symposium on Psychological and Physiological Aspects of Stress** was sponsored by the Western Psychological Association on Friday, June 24. It was held at the California Institute of Technology, Pasadena, California, in conjunction with the meetings of the Pacific Division of the AAAS.

The **Group for Community Guidance Centers**, whose staff now includes more than fifty psychiatrists, psychologists, and psychiatric social workers, announces that in addition to its three guidance centers in New York City, it is now operating a low-cost referral service. Under this part of its program, persons in private practice who may wish to contribute their skills toward the services

of underprivileged families may do so in their private office. For information, write Dr. Ross Thalheimer, 161 West 45th Street, New York 19, New York.

A meeting was held on May 6-7, commemorating the twenty-fifth anniversary of the founding of the **Pavlovian Laboratories** of Johns Hopkins Hospital under the directorship of W. Horsley Gantt. The Pavlovian Society, "dedicated to the objective investigation of causal and treatment factors in psychopathology in the rigorous scientific tradition of Ivan Pavlov," has recently been founded. Membership is restricted to those individuals who have made significant research contributions in the field of psychiatry, psychology, and related sciences. Inquiries concerning this organization and membership should be directed to Dr. Clinton C. Brown, Ph.D., Research Coordinator, Veterans Administration Hospital, Perry Point, Maryland.

The **Twentieth Educational Conference** will be held on October 27 and 28, 1955, at the Roosevelt Hotel in New York City. The conference is again sponsored by the Educational Records Bureau and the American Council on Education. The theme of the conference this year is "Selection and Guidance of Gifted Students for National Survival."

The **American Academy of Psychotherapists** has recently been formed. For information about it write to: Dr. Henry Guze, Secretary, American Academy of Psychotherapists, Department of Psychology, Long Island University, Brooklyn 1, New York.

A series of in-service training lectures, supported by the **Veterans Administration Professional Lecture Program**, was held during the past fiscal year at the Veterans Administration Hospital, Knoxville, Iowa. Participants were: Daniel Blain, who spoke on "Research in Psychiatry"; Pierre J. Pichot, University of Paris, "Language Disturbances in Cerebral Dysfunction"; O. L. Zangwill, Cambridge University, "Handedness, Language Disturbance, Cerebral Dominance and Dysfunction"; Paul E. Huston, "Schizophrenic Thinking," "Experimental Psychodynamics," and "Role of the Nurse in the Psychiatric Hospital"; Julian B. Rotter, "Some Concepts in Social Learning Theory, Research and Clinical Applications"; Wendell John-

son, "Clinical Applications of General Semantics"; and Herbert A. Thelen, "Improving Within-Staff Communication." Arrangements were made by James R. Jack, manager, S. B. Lindley, chief of professional services, and M. H. Gordon, coordinator of research and education for medical services, with the assistance of Arthur L. Benton, consultant. A comparable series is planned for the coming year.

The psychology department of **Crownsville State Hospital** announces its Fourth Annual Workshop, which will take place on November 3-5, 1955. It will be conducted by Karen Machover who will discuss clinical aspects of human figure drawing and other graphic material. For information write to Vernon W. Sparks, Chief Psychologist, Crownsville State Hospital, Crownsville, Maryland.

A conference on the concept of human development will be held at the University of Minnesota on December 8-10. Special recognition will be paid to John E. Anderson for his thirty years of child development research and application. Guest faculty members will include T. C. Schneirla, J. P. Scott, Robert R. Sears, and Heinz Werner. Also invited are experts in the fields of economics, education, psychoanalysis, experimental embryology, psychiatry, philosophy of science, experimental psychology, and anthropology.

The **Systems Psychology Division** of the American Institute for Research is conducting a workshop on October 3-14, 1955, specifically designed to aid manufacturers required by contract to furnish Qualitative Personnel Information to the Air Force. For information write to Robert B. Miller, American Institute for Research, 410 Amberson Avenue, Pittsburgh 32, Pennsylvania.

The **American Nurses' Foundation, Inc.**, announces that it has awarded a grant-in-aid of \$10,372.32 to the VA Hospital, Rutland Heights, Massachusetts, for a one-year research project investigating the relative importance of various aspects of the nurse-patient relationship. This project was approved and sponsored by the Massachusetts State Nurses Association, and the funds have been accepted with the approval of the Chief Medical Director, Department of Medicine and Surgery, Veterans Administration. J. Frank Whiting, chief, clinical psychology service, will be project director. Ellsworth Bourque, chief, vocational

counseling service, will be senior investigator. Katherine Mullane, chief, nursing service, and Elizabeth Ulrich, assistant chief, nursing education, will coordinate the administrative aspects of the project as it relates to nursing service. Tamara Dembo will serve as consultant in psychology and Marie Farrell will serve as consultant in nursing on the project.

Yale University will conduct a year's research on human relations in industry through a \$9,500 grant from **The Foundation for Research on Human Behavior**. The Foundation, which administers research funds contributed by interested business concerns, has also made two grants totaling \$20,000 to the University of Michigan for research on consumer attitudes and behavior.

The Proceedings of the **Fourteenth International Congress of Psychology** are now available at \$3.50 per copy. Order from: Les Editions Psychométriques, Institut de Psychologie, Université de Montréal, Case Postale 6128, Montréal, Canada.

A report of the Conference of **Internationally Minded Schools** in consultation with Unesco has just been issued. It is a pamphlet entitled "The Training of Teachers" and may be obtained by writing to Mr. F. Button, Secretary, Conference of Internationally Minded Schools, 5 Warwick Road, Reading, Bucks, England.

A booklet entitled **Opportunities in Psychology** by Donald E. Super has recently been published. It is one of a series of occupational monographs, and is available for one dollar from Vocational Guidance Manuals, Inc., 1011 E. Tremont Ave., New York 60, New York.

Ohio's Department of Mental Hygiene and Correction has recently published the nation's first **Manual of Applied Correctional Psychology**. DeWitt E. Sell is editor and senior author. Contributing authors are: Robert W. Halliday, Russell G. Leiter, Sheldon B. Peizer, Edward B. Lewis, and John P. Canney.

The National Institute of Mental Health has published a report **Evaluation in Mental Health**, Public Health Service Publication No. 413. This report was prepared by the Subcommittee on Evaluation, Community Services Committee, National Advisory Mental Health Council. It is a presentation of the problems and processes of the evalua-

tive studies in the following areas: Community Organization; Administration; Professional Personnel; Education and Information; Preventive Effects of Programs; Factors Influencing Individual Mental Health; and Diagnostic, Prognostic, and Treatment Procedures. This report is available through the Superintendent of Documents, Government Printing Office, Washington 25, D. C.; price \$2.00.

A **Bibliography on Motivation**, containing 874 items, has been prepared and 100 gratis copies are available on request. Inquiries should be addressed to Mrs. Patricia Young, Psychology Department, University of Hawaii, Honolulu 14, Hawaii.

The **Guide to Psychiatric and Psychological Literature** began publication in March 1955. It appears monthly except in June, July, and August. Its principal feature consists of critical reviews of current books, accompanied by selected bibliography on the topic reviewed. Beginning with the September issue, *The Guide* will carry articles on subjects of current interest or on some new and less known movements in the field. It also carries summaries of major conventions, news about grants, legislation, works in progress, notice of new groups and journals. *The Guide* offers free editorial assistance to writers who have manuscripts intended for publication. The Advisory Editorial Board represents various viewpoints in the field. Among them are: Kurt Goldstein, Harold Kelman, Rollo May, Winfred Overholser, Theodor Reik, Carl Rogers, Lewis Wolberg. The journal is edited by Harry Slochower.

The **International Journal of Social Psychiatry** has recently begun publication. The editors are Joshua Bierer and Thomas A. C. Rennie. Annual subscriptions are \$5.00, and they may be obtained from the International Journal of Social Psychiatry, 9 Fellows Road, London, N. W. 3.

The **James McKeen Cattell Fund** continues to have funds available for grants-in-aid of research in applied psychology. Applications are ordinarily considered at the annual meeting of the trustees of the Fund, which is held in February, each year. They should be filed by January 15. Information and directions for making application for a grant may be obtained by addressing the secretary-treasurer, Dr. Elsie O. Bregman, 425 Riverside Drive, New York 25, New York.



# Convention Calendar

**American Psychological Association:** August 30-September 5, 1956; Chicago, Illinois

*For information write to:*

Dr. Fillmore H. Sanford  
1333 Sixteenth Street N.W.  
Washington 6, D. C.

**Optical Society of America:** October 6-8, 1955; Pittsburgh, Pennsylvania

*For information write to:*

Professor Arthur C. Hardy  
Room 8-203  
Massachusetts Institute of Technology  
Cambridge 39, Massachusetts

**Illinois Psychological Association:** October 21-22, 1955; Chicago, Illinois

*For information write to:*

Dr. George Yacorzynski  
303 East Chicago Avenue  
Chicago, Illinois

**American Occupational Therapy Association:** October 22-28, 1955; San Francisco, California

*For information write to:*

Mrs. Frances L. Shuff  
American Occupational Therapy Association  
33 West 42nd Street  
New York 16, New York

**Gerontological Society:** October 27-29, 1955; Baltimore, Maryland

*For information write to:*

Dr. N. W. Shock  
Baltimore City Hospitals  
Baltimore 24, Maryland

**American Speech and Hearing Association:** November 17-18, 1955; Los Angeles, California

*For information write to:*

Dr. James Carroll  
Speech and Hearing Clinic  
University of Washington  
Seattle, Washington

**American Anthropological Association:** November 17-19, 1955; Boston, Massachusetts

*For information write to:*

Dr. William S. Godfrey, Jr.  
American Anthropological Association  
Logan Museum  
Beloit College  
Beloit, Wisconsin

**National Society for Crippled Children and Adults:** November 27-30, 1955; Chicago, Illinois

*For information write to:*

Miss Jane Shover  
National Society for Crippled Children and Adults, Inc.  
11 South La Salle Street  
Chicago, Illinois

**American Vocational Association:** December 5-9, 1955; Atlantic City, New Jersey

*For information write to:*

Mr. A. Lowell Burkett  
American Vocational Association  
1010 Vermont Avenue N.W.  
Washington 5, D. C.

**Third Inter-American Congress of Psychology:** December 16-21, 1955; Austin, Texas

*For information write to:*

Dr. Werner Wolff  
Bard College  
Annandale-on-Hudson  
New York

**American Association for the Advancement of Science:** December 26-31, 1955; Atlanta, Georgia

*For information write to:*

Dr. Raymond L. Taylor  
American Association for the Advancement of Science  
1025 Connecticut Avenue N.W.  
Washington 6, D. C.

**American Statistical Association:** December 27-30, 1955; New York City

*For information write to:*

Mr. Samuel Weiss  
1108 Sixteenth Street N.W.  
Washington, D. C.

**American Genetic Association:** January 12, 1956; Washington, D. C.

*For information write to:*

Mrs. Barbara Lake  
1507 N Street N.W.  
Washington 5, D. C.

**American Group Psychotherapy Association:** January 13-14, 1956; New York City

*For information write to:*

Dr. Norman Locke  
American Group Psychotherapy Association  
228 East 19th Street  
New York 3, New York

**Ontario Psychological Association:** February 3-4, 1956; Kingston, Ontario, Canada

*For information write to:*

Dr. J. M. Blackburn  
Department of Psychology  
Queen's University  
Kingston, Ontario, Canada

## PERCEPTUAL AND MOTOR SKILLS

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D. A. Grant, N. F. Kaestner, and L. M. Schipper: Autocorrelation analysis of gross learning scores.

J. T. Freeman and J. Engler: Perceptual recognition thresholds as a function of multiple and single set and frequency of usage of the stimulus material.

R. G. Farr, C. H. Russell, and R. Marion: Apparatus for studying serial learning.

R. G. Farr, Mukul K. Dey, and Edith Bloch: A compensatory pursuit task.

R. B. Ammons, and C. H. Ammons: Motor skills bibliography: X. Psychological Abstracts, 1940, Volume 13.

Unpublished research underway or completed.

News and notes.

New material listing and brief reviews.

### DETAILS OF PUBLISHING ARRANGEMENTS.

Quarterly. March, June, September, December. A minimum of 200 pages a year. Subscription is \$7.00 per year, with special rates to members of certain professional organizations.

Editors include C. H. Ammons, R. B. Ammons, S. H. Bartley, E. A. Bilodeau, H. F. Buegel, T. W. Cook, M. R. Denny, A. Espenschade, R. Glassow, J. Hochberg, A. Irion, G. A. Kimble, N. H. Mackworth, C. W. Mann, A. H. Shephard, A. Slater-Hammel, K. U. Smith, R. L. Solomon, S. D. S. Spragg, A. T. Welford, and P. Worchel.

Content. Material dealing with perception or motor skills, especially as affected by experience; general methodology; brief summaries of research underway or completed but not yet published; news and notes; new book listing and reviews.

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The T.A.T. and C.A.T. in Clinical Use pp. 282. Grune & Stratton, New York, by Leopold Bellak, offers extensive discussion and case material for CAT and C.A.T.-S. (\$6.75)

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